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**Resume of  
Wayne O. Jefferson**

Major General Wayne O. Jefferson, Jr., USAF (Ret.)

Major General Jefferson is currently an Associate with Burdeshaw Associates, Ltd. (BAL) and with Parsons Associates.

From 1994 until the present, General Jefferson has been a consultant in management, management training, and quantitative probabilistic analysis.

From May 1992 to May 1994, General Jefferson was employed in private industry as Executive Director of LCC, Inc. and responsible for the accounting and finance, human resources and training functions of that company. He also served as the acting chief financial officer for 6 months. From May 1991 to May 1992, he was the General Manager of TSI, Inc., with total profit and loss responsibility for this rapidly growing company. Both of these companies were involved with engineering design support and deployment of the wireless elements of cellular telephone systems.

From 1989 to 1991, General Jefferson was President of Jefferson Associates, Inc., a consulting firm, and an Associate with Burdeshaw Associates, Ltd. (BAL).

General Jefferson retired from the U.S. Air Force on 11 July 1989 after more than 30 years of highly successful experience in leadership, decision-making, planning and management.

From April 1988 until completing service, General Jefferson served as the Joint Staffs Deputy Director for Defense-Wide C3 Support. In this position, he ensured the integrity, interoperability, evolutionary capability and technical efficiency of all systems employed in the Defense Department's entire command, control and communications system.

From 1985 to 1988, he headed NATO's Communications and Information Systems Division on the International Military Staff in Brussels, directing NATO's highest level military C3 policy structure.

From 1984 to 1986, General Jefferson headed the Joint Staff's first Deputy Directorate for C3 Connectivity and Evaluation, directing the exercise and evaluation of the Defense Department's command and control systems in order to assure their operational capability under severe stress.

From 1980 to 1984, General Jefferson held positions of rapidly increasing responsibility with the Strategic Air Command (SAC). In 1983-84, he was Assistant Deputy Chief of Staff for Operations, overseeing the entire scope of SAC's worldwide bomber, tanker, missile and reconnaissance operations, including training range development and flight operations. In 1982-83 he was SAC's Director of Command Control, responsible for the operation of SAC's tight command and control system, including the underground command center in Omaha and the airborne command post. In 1981, as SAC's Assistant Director of Plans and Policy, he was responsible for the analysis and development of SAC's future force requirements, the preparation of SAC's annual budget, and basing plans for new weapons systems. In 1980-81, he commanded a B-52 bomb wing with 17 B-52H bombers and 22 KC-135 tankers.

Prior experience included nuclear test and evaluation, Air Staff mission area planning, Vietnam flight operations, and faculty member at both the US Air Force Academy and the National War College in simulation, economics and management, focusing on operations research and quantitative decision making involving probabilistic methods.

#### Educational Background

Senior Managers in Government Program, Harvard University

M.S. in Operations Research, Stanford University

M.B.A., Auburn University

Technical University of Munich, Germany. Two years E.E. (in German)

B.S., U. S. Air Force Academy (distinguished graduate)

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National War College (graduate and faculty member)  
Air Command and Staff College (distinguished graduate)

Overseas experience

Belgium, Germany, Vietnam

Language capability in German, French, and Spanish

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# **Resume of Ronald E. Fly**

RONALD E. FLY, Colonel, USAF (Retired)  
901 S. Frankland Rd., Tampa, Florida 33629  
(813) 254-2069

## CAREER SUMMARY

Self-employed as a consultant and a partner for a Tampa based business. Has worked extensively as a Burdeshaw Associate with the National Imagery & Mapping Agency and the Shaw Pittman law firm.

Twenty-four years of demonstrated accomplishment in leadership, management and staff positions. Extensive operational experience to include leading three large organizations.

## LEADERSHIP POSITIONS

Commander, 388<sup>th</sup> Fighter Wing, Led 2,200 personnel in nine squadrons with an annual budget of \$66M.

- Maintained a 4% higher aircraft readiness rate at a 20% lower operating cost than two similar organizations, an annualized saving of \$6,970,000.
- Executed the first "no-notice" Air Expeditionary Force, generated the tasked aircraft and 5 spares 12 hours ahead of schedule.

Commander, 8<sup>th</sup> Operations Group. In charge of 830 personnel in 3 squadrons with an annual budget of \$24M.

- Exceeded every command readiness standard, fighter squadrons took first and second place in the command wide bombing competition.
- Aggressively managed aircraft engine repair flow to prevent the loss of 25 engines.

Commander, 63<sup>rd</sup> Fighter Squadron. Responsibilities for 325 personnel and an annual operations and maintenance budget of \$10M.

- Turned the perennial "also ran" into the wing's premier fighter squadron. Won the Annual Top Combat Unit competition by the largest margin on record and swept every major maintenance and operational category.
- Maintained the wing's highest readiness rate using only 54% of the operations and maintenance budget.

## STAFF POSITIONS

Chief, Defense and Space Operations Division, The Joint Staff. Responsible for operational cognizance over all air and missile defense matters, and space

operations. Worked extensively at the inter-agency level on Intelligence and Missile Defense. Co-chaired the Quadrennial Defense Review Navigation Warfare subpanel.

Action Officer, International Affairs Division, Headquarters USAF. One of only six officers designated by the Secretary of the Air Force with the authority to release sensitive classified and unclassified information and technologies to foreign governments and international organizations.

## OPERATIONS

Seventeen years experience in all phases of aviation to include, flight operations, maintenance, logistics, quality assurance, training and scheduling.

## STRATEGIC PLANNING

Co-chaired the operations panel for the 1995-96 Advanced Battlespace Information Study commissioned by the Undersecretary of Defense Deputy for Research and Engineering and the Joint Chiefs of Staff. The Department of Defense accepted the report recommendations and redirected command and control research funds to those programs which supported the study's technology roadmap. This study, published in 1996, served as a cornerstone for the Joint Chiefs of Staffs 15 year strategic plan, *Joint Vision 2010*.

Instituted an infrastructure planning process addressing the unit's 77 buildings and 1.3 million square feet of floor space. Procured \$80,000 from regional headquarters for a long-term engineering development plan.

## OPERATIONAL ANALYSIS

Used unit cost and repair data to isolate a low-cost, high failure rate item in the F-16 wheel brake system. Formed and directed a team of technical experts to investigate the problem and develop corrective actions. The locally developed procedures were adopted Air Force wide in 1995.

Developed a unit based metric for tracking aircraft engine transportation to and from the Pacific regional repair facility. This metric was adopted throughout the Pacific Air Forces in 1995 and led to an asset reallocation reducing the transportation time 375%.

## EDUCATION

National Security Manager's Course, Syracuse University, 1996  
(2 month executive education)

Master of Science (Management), Troy State University 1985

Bachelor of Science (Economics), US Air Force Academy, 1974

## PROFESSIONAL MILITARY EDUCATION

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NATO Defense College, Rome, Italy, 1994  
Air War College, 1988  
Air Command and Staff College, 1985

RONALD E. FLY, Colonel, USAF (Retired)  
Addendum

**EDUCATION & TRAINING**

Member, Board of Directors, Air Combat Command's Professional Military Education. Set the education and training policy and guide lines for approximately 90,000 USAF personnel.

Eight years experience as a formal course instructor.

- Wrote course objectives, study guides, teaching manuals, tests and other academic courseware.
- Designed syllabi to include integrated academic and advanced practical training flow.
- Academic instructor, taught all phases of aerial combat, air-to-air munitions, radar, electronic countermeasures, and aerospace physiology.
- Multiple awards as the Top Academic Instructor and the Best Instructor Pilot.

**INTERNATIONAL AFFAIRS**

Over four years experience in the HQ USAF International Affairs Division Office of the Vice Chief of Staff.

- 2½ years on the Middle East Africa desk, 2 years as the NATO and multinational desk officer
- Daily interaction with foreign attaches concerning access to USAF information and visits to USAF installations
- Technology Transfer . . . served as the gatekeepers for technology
  - Chairman, F-16 Multinational Technical Coordinating Group (US and the four NATO F-16 co-production partners). Responsible for resolving all technology transfer issues within the group.
  - Recognized expert in weapons systems, fighter aircraft, radars, and electronic countermeasures
  - Authored the USAF LANTIRN release policy, approved by CSAF



- IIQ USAF lead on the UK and French E-3 AWACS sale, adroitly handled several key issues concerning software and technical drawings.

## SPACE OPERATIONS

Planned and led the ICS sponsored Tactical Exploitation of National Capabilities (TENCAP) Special Project 97 exercise. Focused on providing national capability to support theater ballistic missile defense initiatives.

Defense Support Program. The JCS lead for the current shared early warning program. Met the aggressive schedule directed by the President to provide Israel with an early warning capability, established the baseline architecture for the growing SEW initiative.

Routinely Co-chaired the NIMA Customer Advisory Board involving over 12 different agencies. Helped ensure a smooth transition as NIMA was formed by merging other agencies.

## NATIONAL MISSILE DEFENSE

Designed and developed the exercise evaluation program to test NMD weapons engagement scenarios and weapons release authority levels.

## PLANNING

Planned and procured funding for \$7M major runway infrastructure repair project at Munsan AB, Korea. The project, involving moving over 600 personnel and \$1B dollars worth of assets to two other operating locations, was successfully executed providing much needed infrastructure repair and enhancement.

## CONTINGENCY EXECUTION

Led the Hurricane Andrew evacuation, involving 75 airplanes and over 200 personnel, from MacDill AFB, FL to Dobbins AFB, GA. The short notice evacuation was smoothly executed with minimum problems.

## OPERATIONAL TEST AND EVALUATION

Commander of the Utah Test and Training Range., the largest overland range in the free world and the only overland range authorized for test of cruise missiles and other large safety footprint weapons.

- Directed the use and implementation of test range assets for calibration of airborne laser targeting systems. Leveraged the use of test equipment to improve operational capability.

- Implemented new procedures to increase range safety and minimize the possibility of damage to non-test facilities located on the range.

#### LOGISTICAL SUPPORT

Identified problems with a high cost, high failure rate component of the F-16 radar.

- Developed local operational and repair procedures to increase the mean time between failure rate and increase the radar reliability.
- Directed technicians to work with the regional repair facility and identify a long term improvement. A redesign of the component involving a new memory chip was developed and an 18 month replacement plan initiated.

Primary Witness Responsibility for Answers to Questions in Testimony of  
James L. Cole, Jr., Wayne O. Jefferson, Jr. and Ronald E. Fly

Question	Subject	LEAD
25	Describe issues to which you are testifying	All
26	Where is assessment documented	All
27	What hazard was determined	Jefferson
28	How was it determined	Jefferson
29	What did you do to assess the nature of the accidents	All
30	Summarize Skull Valley F-16 flights and potential hazard to PFSF	All
31	Summarize flight activities in UTTR and their associated hazard	All
32	Summarize Moser Recovery operations and hazard posed	Cole
33	Summarize IR-420 operations and hazard	Cole
34	Summarize jettisoned ordnance hazard	Jefferson
35	Describe airspace where PFSF is located	Fly
36	Describe military air operations near PFSF	Fly
37	Have you assessed hazards by category	All
38	Describe F-16 traffic that transits Skull Valley	Fly
39	What hazards do F-16s pose	Fly
40	How did you calculate probability of F-16 crash	Jefferson
41	How was C, crash rate per mile, calculated	Jefferson
42	How was N, number of flights, calculated	Jefferson
43	How was A, effective area, calculated	Jefferson
44	How was W, width of airway for Skull Valley, calculated	Jefferson
45	How was R, pilot avoidance reduction factor, calculated	Jefferson
46	Crash probability for F-16s transiting Skull Valley	Jefferson
47	Basis for 5,870 flights per year	All
48	Did number of sorties change since FY88	All
49	Why is FY88-FY00 average appropriate	All
50	Did anything else change that affects expected flights through Skull Valley	All
51	Why are Skull Valley sorties proportional to aircraft at Hill AFB	Fly
52	What happens if FY00 used as baseline sortie count	Jefferson
53	Is an increase above FY00 expected for the lifetime of PFSF	Fly
54	How did State challenge your transiting F-16 calculations	All
55	How do you respond	All

56	Elaborate on State's claim concerning additional aircraft at Hill AFB and sorties	Fly
57	Have the effects of additional aircraft been accounted for	All
58	Why does State say FY99-FY00 average inappropriate as sortie baseline	All
59	Should PFS have used the higher FY00 sortie rate	All
60	State claims about bathtub effect	Jefferson
61	Is State correct about FY99 accident rate and bathtub effect	Jefferson
62	Your evaluation of F-16 exhibiting a bathtub effect	Jefferson
63	Does 5 or 10 year rolling average of destroyed aircraft show a bathtub effect	Jefferson
64	What happened with respect to F-16A crash rates	Jefferson
65	Have we reviewed other Air Force fighters being phased out for bathtub effect	Jefferson
66	Have other Air Force aircraft shown a rise in rates due to bathtub effect	Jefferson
67	Do we expect F-16 to display a bathtub effect in the future	Jefferson
68	Which accident rate is most appropriate to use	All
69	Why else does State contend the wrong accident rate was used	All
70	Is State correct regarding potential effect of replacement of F-16	All
71	Will Hill F-16s necessarily be replaced by the first F-22's or JSFs	All
72	State objections to F-16 flight distribution in Skull Valley	All
73	Describe "turning point" and "sensor alignment"	Fly
74	Will PFSF fundamentally change historic flight patterns	Fly
75	Why is your distribution of flights in Skull Valley conservative	Jefferson
76	Why won't PFSF construction make pilots fly over or near it	Fly
77	Why won't pilots use PFSF as navigational turning point as claimed by State	Fly
78	Why won't pilots overfly the PFS site for sensor alignment	Fly
79	If hypothetically pilots used PFSF as nav/sensor point, how does State overstate the risk	Fly
80	State's claim concerning Skull Valley width and F-16 flight distribution	All
81	How did you arrive at 10 mile width and F-16 distribution	Jefferson
82	Other factors making eastern side of Skull Valley favored route	Fly
83	Other info showing F-16s would tend to pass away from the PFSF not close to it	All
84	Conclusion regarding State challenge of 10 mile width	Jefferson
85	Describe State's objections concerning pilot avoidance and pilot experience	Fly
86	Is State correct concerning experience and pilots guiding aircraft away	Fly
87	Did you see anything in accident reports indicating experience impacted pilots actions	All
88	Describe State's objections concerning pilot avoidance and weather	Fly
89	Do you agree	Fly
90	Describe cloud cover data relied upon by the State	Fly

91	Assuming a ceiling in Skull Valley, would that necessarily prevent seeing or avoiding PFSF	Fly
92	Describe assessment of weather impacts on pilot avoidance of PFSF	Fly
93	What did accident reports show regarding effects of weather and being able to avoid	All
94	What conclusions can be drawn from the accident reports concerning weather	Fly
95	What adjustments need to be made to account for weather	All
96	State objections to likelihood of pilots being able to control the aircraft	All
97	How do you respond	All
98	How did you assess probability pilot would be left in control	All
99	How did you define evaluation parameters	All
100	In what respects did the State challenge your assessment	Jefferson
101	How do we respond regarding engine failure frequency	All
102	State objections to individual accident report assessments	Jefferson
103	25 May 90 accident, 300' low level at Moody AFB	All
104	19 Sep 90 night, simulated radar delivery	Fly
105	20 Feb 91 engine failure, Diyarbakir, Turkey	Fly
106	19 Mar 91 SMS, electrical failure	Fly
107	4 Apr 91 fighting wing and clouds	Fly
108	8 Jun 91 Tex 22, engine failure at Ellington AFB	Fly
109	31 Jul 92 Retro 34, night radar trail, overseas deployment	Fly
110	16 Sep 97 NJ night vision goggles	Fly
111	19 Feb 93 Rolex 24, range, engine failure, pitch up into clouds	Fly
112	13 Jan 95 low level engine failure, Belgium	Fly
113	29 Jan 97 target egress, engine failure, Gila Bend	Fly
114	13 May 98 white pelicans impact	Fly
115	Have state challenges given you any reason to change assessment	Fly
116	State objections to statistical inferences	Jefferson
117	Is State correct	Jefferson
118	Other State objections concerning F-16 crash statistics	All
119	Is State correct	All
120	Your conclusions about State challenges	All
121	UTTR operations	Fly
122	Hazard posed by air-air training on UTTR	Fly
123	Elaborate on likely locations for crashes on the UTTR	All
124	Elaborate on pilots ability to avoid PFSF	Fly
125	Hazard posed by air-air training on UTTR	Fly

126	Was air-air hazard ever calculated differently	Jefferson
127	Why did you change assessment	Jefferson
128	Did State challenge your UTTR assessment	Jefferson
129	Are State challenges relevant	Jefferson
130	Did State address or consider your new assessment based upon actual reports	All
131	What is the Moser recovery	Fly
132	How many aircraft use the Moser	Cole
133	Hazard posed by Moser	Jefferson
134	Did state challenge your Moser assessment	All
135	Is State correct	All
136	How do aircraft fly to Michael Army Airfield (MAAF) on IR-420	Fly
137	How did PFS calculate hazard posed by flights	Jefferson
138	Has IR-420 traffic changed	Cole
139	MAAF takeoffs & landings	All
140	Did State challenge your IR-420 assessment	Cole
141	Do we account for all MAAF traffic on IR-420	All
142	Potential for inadvertent ordnance release	All
143	Could ordnance carried on F-16 pose a threat	Jefferson
144	What ordnance hazard did you calculate	Jefferson
145	Did ordnance carriage change since FY 98	Jefferson
146	What if you use FY00 sortie counts as baseline instead of FY99-FY00 average	Jefferson
147	Could ordnance carried on F-16 pose a hazard in any other respect	All
148	Did you calculate a hazard based upon a nearby explosion of jettisoned ordnance	Jefferson
149	How did you determine whether a nearby explosion would damage a cask or CTB	Jefferson
150	How did you calculate hazard posed by nearby explosions	Jefferson
151	Have changes in ordnance useage affected your assessment	Jefferson
152	What if plane crashes with two bombs or bombs were jettisoned simultaneously	Jefferson
153	Did State challenge jettisoned ordnance assessment	Jefferson
154	What is the effect of increasing site area as State proposes	Jefferson
155	What other claims did State make concerning jettisoned ordnance	All
156	Is State correct	All
157	Did State make any other claims about jettisoned ordnance	All
158	Is State correct	All
159	Did State challenge calculations of potential hazard posed by nearby explosions	All
160	Does State claim affect your assessment	Jefferson

- 161 What is cumulative aircraft crash and jettisoned ordnance hazard to PFSS
- 162 What effect would Skull Valley F-16 sensitivity analysis have on cumulative hazard
- 163 Does aircraft crash hazard assessment remain conservative
- 164 What is the cumulative effect of all the conservatism
- 165 What is the cumulative aircraft crash and jettisoned ordnance hazard
- 166 How does this compare with NRC limit

Jefferson

Jefferson

Jefferson

Jefferson

Jefferson

All

1 Q. (By Mr. Gaukler) And this document is  
2 dated February 19, 2002?

3 GENERAL COLE: That's correct.

4 COLONEL FLY: Yes, it is.

5 Q. And it's comprised of 114 pages plus  
6 copies of your resumes; is that correct?

7 GENERAL COLE: That's correct.

8 COLONEL FLY: Correct.

9 GENERAL JEFFERSON: Yes.

10 Q. Now, this is your testimony that was  
11 prepared by you or under your supervision and  
12 direction?

13 GENERAL COLE: That's correct.

14 COLONEL FLY: That's correct.

15 GENERAL JEFFERSON: That's correct.

16 Q. Now, I've already described some  
17 changes that were made, incorporated into your  
18 testimony to incorporate the Board's ruling  
19 yesterday on excluding certain evidence. Have you  
20 made any other changes reflected in the copy of  
21 your testimony that we just handed out?

22 GENERAL COLE: We have.

23 Q. Would you please summarize those  
24 changes.

25 GENERAL COLE: Yes, sir, we will delete

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1 references to the buffer zone, the one on the  
2 western edge of the MOA, the two-mile buffer zone.  
3 And those are annotated on the copies. They are  
4 on pages 17, 36, 38, 40, 45, 51, 103 and 113. And  
5 those are all marked out and deleted.

6 And one additional deletion, page 97.  
7 There is a parenthetical there That says doubled  
8 controllers' estimate. Delete that parenthetical.  
9 Delete doubled controllers' estimate, relating to  
10 the Moser recovery. And those are all the  
11 corrections we have, sir.

12 Q. Would you explain why you made those  
13 changes, please?

14 GENERAL COLE: In an adjustment with  
15 Hill Air Force Base, the buffer zone that is cited  
16 is not in a regulation so much as an informal  
17 two-mile area. We thought it would be more  
18 appropriate and proper to just delete it, since  
19 it's an unofficial buffer zone. And secondly, the  
20 deletion of the parenthetical regarding doubled  
21 the controllers' estimate, we simply used the five  
22 percent the controller gave us. We did not double  
23 that estimate in that instance.

24 Q. With these changes, do you accept and  
25 adopt this testimony as your testimony in this

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1 proceeding?

2 GENERAL COLE: Yes, we do.

3 COLONEL FLY: Yes, we do.

4 MR. GAUKLER: Your Honor, I would like  
5 to go through the exhibits now that we would like  
6 to have introduced for these witnesses. The first  
7 exhibit is the aircraft crash report dated August  
8 10, 2000. It's entitled Private Fuel Storage  
9 Aircraft Crash Hazard of the Private Fuel Storage  
10 facility. Revision four. This copy was provided  
11 as part of our Motion for Summary Disposition to  
12 the Board and the parties, and so we have a copy  
13 for the court reporter, but I do not have other  
14 copies to hand out, with the understanding that  
15 you have brought those copies with you. There are  
16 certain provisions --

17 We have just handed a copy to the  
18 reporter. We'd like to have the report marked as  
19 Exhibit N. There are certain portions of the  
20 exhibit that we will not be introducing. Those  
21 are Section 2 of the exhibit, regulatory standards  
22 of aircraft hazards. Section 4.B, air to ground  
23 training on the south UTTR. Section 8, crash  
24 hazards, pools and aircraft on Federal airways.  
25 Section 9, general aviation aircraft, tab O

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1 associated with Section 9. Section 10, or tab X  
2 also associated with general aviation aircraft.  
3 And then also we will not be introducing in  
4 accordance with the Board's decision yesterday,  
5 Section 11 concerning the conservatisms with  
6 respect to cask penetration, and tab N, that goes  
7 along with that section.

8 Also, there are some general statements  
9 of conservatisms that summarizes the cask impact  
10 penetration which are not being introduced, and we  
11 would just ask the parties and the Board to note  
12 that.

13 JUDGE LAM: Were they marked up as not  
14 introduced, or are you relying on the parties?

15 MR. GAUKLER: I have not marked them  
16 up. If the Board wants us to do that, we could,  
17 but I have not done that.

18 JUDGE FARRAR: These are the matters we  
19 discussed at the bench?

20 MR. GAUKLER: Well, yes, they're the  
21 same type of matters, but they're in the air crash  
22 report. And basically, what we are talking about  
23 is that the penetration of the cask calculation  
24 that we did by aircraft engines.

25 JUDGE FARRAR: And you're offering this

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1 now?

2 MR. GAUKLER: I would have to like to  
3 have it marked as Exhibit N and offered.

4 JUDGE FARRAR: Okay. Give it to the  
5 reporter.

6 MR. TURK: Can we go off the record for  
7 a moment, Your Honor?

8 JUDGE FARRAR: Yes.

9 (EXHIBIT-N MARKED.)

10 JUDGE FARRAR: Back on the record. Go  
11 ahead.

12 MR. SOPER: Thank you. So far, the  
13 status seems to be that the panel testimony has  
14 been offered. I don't know if that's been passed  
15 to me for objection yet. But exhibits are now  
16 being offered. Are we going to reserve objections  
17 until all the testimony is offered or singly, is  
18 my first question, and then second, is that, I  
19 tried to be diligent and write down all the  
20 deletions, amendments and so forth, and even those  
21 that were described generally not by paragraph,  
22 and I failed. Could we ask the Applicant to  
23 submit some sort of an index to all the changes  
24 that are made? I don't know how I can possibly  
25 assess that and give any sort of a reasonable

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1 objection to it on the spur of the moment.

2 JUDGE FARRAR: Let me add to that Judge  
3 Lam has already mentioned to me a concern that  
4 down the road someone will pick up this document  
5 and say, a-hah, this was an exhibit and it won't  
6 be obvious to them, Mr. Gaukler, about the parts  
7 that were not offered. Maybe a remedy is, could  
8 you in the next day or so, maybe even just have it  
9 typed -- we have two choices, go through that and  
10 mark it up indicating the parts that are removed  
11 or you could just have a front piece.

12 MR. GAUKLER: I would suggest a front  
13 piece where we say that certain sections are not  
14 included as part of the exhibit. And then if, I  
15 think we could probably go through on the  
16 conservatism part and mark out the particular  
17 paragraphs as I read it on the testimony, it's  
18 very -- it would be similar. So I would propose  
19 to do that and I will provide the Board and the  
20 parties with both the up-front listing of the  
21 sections that are out completely and pages where  
22 there's markups, we could provide you those, as  
23 well.

24 JUDGE FARRAR: I'm particularly  
25 concerned because somehow I get the feeling that

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1 our decision will not be the last word in this  
2 case, and there may be other tribunals after us  
3 who are faced with a record, and we want it to be  
4 comprehensible to them.

5 MR. GAUKLER: So I will do that -- we  
6 will do that and try to have that done by  
7 tomorrow.

8 MR. TURK: Your Honor, I share your  
9 concern about other tribunals who may be reviewing  
10 the record here, the Commission and possibly the  
11 Court of Appeals. And I think there should be an  
12 exhibit in the record that's easy for them to  
13 simply open up and say this is the document that  
14 is in evidence, rather than try to understand what  
15 is in evidence and what is not in evidence. And I  
16 would ask the Applicant to take the time, have a  
17 paralegal or someone take out the sections of the  
18 report that are no longer being offered, photocopy  
19 it and then produce it as an exhibit.

20 JUDGE FARRAR: Physically remove  
21 Section 8, for example?

22 MR. TURK: Whatever sections they are  
23 not offering.

24 JUDGE LAM: Or mark it up like what we  
25 have seen here on the direct testimony.

1 MR. TURK: That's another way to do it,  
2 but if they're taking out whole sections, it might  
3 simply be easier to remove the sections.

4 MR. GAUKLER: Or could I just have Your  
5 Honors instead of removing -- each of the parties  
6 could remove the sections themselves from the book  
7 they already have and we could on the copies we  
8 provide the court reporter certainly do that, take  
9 those sections out. One of the reasons, these are  
10 very lengthy books with a lot of charts, et  
11 cetera. And so I have no problem in doing that.  
12 We would just take out the sections that we are  
13 not introducing in the report that we provide the  
14 court reporter, and mark out the other stuff and  
15 provide a copy of the pages that we mark out to  
16 everybody. And a list of the sections that we are  
17 excluding. So we'll do that.

18 MR. SOPER: I would join with the  
19 Staff, Your Honor. I think that arrows and lines  
20 through things are not sufficient for the caliber  
21 of this proceeding and what's at stake. I think  
22 we ought to have a clean record, a clean document.  
23 No references to generally we struck this type of  
24 item, but a new document with what's in the  
25 record.

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1 (A discussion was held between the  
2 judges.)

3 JUDGE FARRAR: We all certainly are in  
4 agreement that particularly given the magnitude of  
5 the case, we've got to have a record that is  
6 entirely comprehensible to the next group or group  
7 of judges who look at it.

8 On the testimony, we kind of prefer the  
9 way you did it, because I assume someone may at  
10 some point challenge yesterday's ruling and the  
11 beauty of the testimony the way it is, is that  
12 reflects the ruling. They excluded the material  
13 we said shouldn't come in, and that's perfectly  
14 clear. On the document, my concern is, we're away  
15 from -- almost everybody in the room is away from  
16 home except you all, and it may be a little  
17 difficult to do this or there may be half pages,  
18 you know, how you rip those out. We would think  
19 that any system that's foolproof, in other words,  
20 where when you pick up the document three years  
21 from now, there's no question about what's out.  
22 In other words, it's not a separate piece of paper  
23 that could get taken away and lost and so you  
24 don't know what happened. As long as there's some  
25 way that you physically have marked it up. Maybe

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1 you could go through the table of contents and  
2 strike out Section 8 and then at the beginning of  
3 Section 8, this section, you know, put it in  
4 something in black, this section removed. That  
5 would I think satisfy us and anybody looking at it  
6 later.

7 MR. GAUKLER: We can do that, Your  
8 Honor, as well as mark out the particular pages of  
9 the particular paragraphs that come out, we can  
10 strike them out just as we did in the testimony.  
11 The sections, particular sections that we are not  
12 introducing were summarized in a letter that we  
13 sent to the Board back --

14 JUDGE FARRAR: I have no problem with  
15 that, Mr. Gaukler. Just, for example, somebody  
16 three years from now won't find that letter and  
17 associate it with the document. There's nothing  
18 wrong with what you're doing, it's just physically  
19 how we reserve the right kind of record.

20 MR. GAUKLER: Why don't I do this, Your  
21 Honor. I will mark up a copy as Your Honor  
22 suggests with a table of contents and the heading  
23 on various pages and provide that to the court  
24 reporter, and I will provide the Board and the  
25 parties a complete set of all the marked up pages

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1 to put in their copies, so everybody will have an  
2 identical set.

3 JUDGE LAM: Now, how big is Exhibit N?  
4 I see. If you're going through all that, you  
5 might as well give us a new copy.

6 MR. GAUKLER: Well, most of the  
7 sections are just -- there are about four or five  
8 sections that are out. It would just be a matter  
9 of putting on those pages that those sections are  
10 out and handwritten. And then there's a couple on  
11 conservatisms, where we talk about conservatisms  
12 we have to go through like we did in the testimony  
13 and mark out paragraphs.

14 JUDGE FARRAR: Okay. So you'll do that  
15 on one --

16 MR. GAUKLER: Yes.

17 JUDGE FARRAR: Photocopy it, substitute  
18 those at some point this week with the reporter  
19 and give copies to the parties?

20 MR. GAUKLER: Yes. The marked up  
21 pages, those that would go in your copies.

22 MR. SOPER: Your Honor, we need -- we  
23 were never served with Exhibit N. We were just  
24 told to use the original crash report. So we do  
25 not have this exhibit. We need to preserve what

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1 we have for our records. So if we could ask for a  
2 new copy of whatever is being offered as Exhibit  
3 N, whether it's a hand strikeouts or whatever,  
4 we'd appreciate that.

5 MR. GAUKLER: It's --

6 JUDGE FARRAR: You have the same thing  
7 we do, I think.

8 MR. SOPER: You didn't get an Exhibit  
9 N, either. Okay. So, then, we each need one.

10 JUDGE FARRAR: All we did is bring our  
11 file copy from before.

12 MR. GAUKLER: Right. And now what I'm  
13 suggesting is -- well, for example, Section 11 on  
14 the heading of that first page, we'll mark this  
15 section is deleted from the exhibit and we will  
16 give everybody the first page of that section  
17 which says that. But to insert into the book that  
18 they already have.

19 And also, we had discussed this at  
20 the -- you know, we discussed this at the  
21 pre-hearing, also we discussed in the context of  
22 when we wrote the letter to the Board --

23 JUDGE FARRAR: You know, no one's  
24 faulting -- no one's faulting what you've done.  
25 We're just trying to see how we -- as a matter of

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1 notice, we're just going to conform. I'm a little  
2 nervous about each of us taking our old copy and  
3 inserting loose -- you know, trusting ourselves to  
4 do the looseleaf insertion and deletion. We all  
5 did that at some job we had as young people, and  
6 we all did it wrong at some point or another, and  
7 I'm not sure we're any better now. If you've got  
8 to run some copies, is it any harder to run 15  
9 copies than to run three?

10 MR. GAUKLER: It's a matter of just the  
11 color photographs and things like that, to put the  
12 whole book together again.

13 JUDGE FARRAR: Oh, the photographs.

14 MR. GAUKLER: And the whole book with  
15 tabs. It can be done. We can do that, if that's  
16 what Your Honor desires.

17 MS. NAKAHARA: Your Honor, if I may.  
18 We're using our aircraft crash report that was  
19 submitted as part of a copy -- excuse me, a copy  
20 for a response to questions from the NRC Staff.  
21 We would like to preserve that copy for future use  
22 and not have to take that copy apart.

23 MR. TURK: Your Honor, may I ask we go  
24 off the record again? I think we can revolve it  
25 by negotiated settlement.

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1 JUDGE FARRAR: The parties have been  
2 very good over the last several months of taking  
3 things like this, and we could go on for several  
4 minutes or hours burdening the court reporter and  
5 ourselves and maybe getting nowhere. So let's go  
6 off the record.

7 (A discussion was held off the record.)

8 JUDGE FARRAR: The parties have reached  
9 an accommodation, the Applicant, because of some  
10 points made by the State about needing to preserve  
11 the copies they now have, the Applicant has agreed  
12 to make full new copies which we'll get to the  
13 court reporter before the end of this week to  
14 substitute. Meanwhile we'll proceed with the  
15 documents the way we have. And if any of you in  
16 the audience are saying at this pace, how are we  
17 going to finish by Saturday, now you know why I  
18 asked. But a lot of this, once getting the  
19 witnesses sworn, getting the exhibits in, getting  
20 all the housekeeping done, takes a little bit of  
21 time at the beginning and then once this is all  
22 done, we'll be moving on much more rapidly.

23 Go ahead, Mr. Gaukler.

24 MR. GAUKLER: Picking up what Mr. Soper  
25 said, I would move for the admission of the

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1 testimony of General Cole, General Jefferson and  
2 Colonel Fly.

3 JUDGE FARRAR: Any objection?

4 MR. GAUKLER: This is the prefiled  
5 written testimony as correctly handed out.

6 MR. SOPER: The State does have an  
7 objection, Your Honor. Number 1 was the issue  
8 that was raised just before the proceeding, and  
9 that is as to page 112, the second paragraph. As  
10 we discussed earlier, that page addresses  
11 consequences and it's the State's position that  
12 that's been ruled outside the scope of this  
13 proceeding.

14 JUDGE FARRAR: In line with the  
15 discussion we had, let's carry that motion with  
16 the case for the moment.

17 MR. SOPER: All right. The second  
18 objection is concerning question 26, it's on page  
19 eight, by which the witnesses adopt the crash  
20 report as their analysis, and also it just goes to  
21 the crash report to Exhibit N as an exhibit, and  
22 that is Paragraphs 84, 85 and 86. In the State's  
23 view, deal with consequences, ought to be  
24 excluded, stricken.

25 JUDGE FARRAR: The paragraphs of the

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1 report or --

2 MR. SOPER: Yes, that would be of the  
3 Exhibit N, the crash report.

4 JUDGE FARRAR: Let me before you keep  
5 going, Mr. Gaukler, are those paragraphs you did  
6 not strike?

7 MR. GAUKLER: I'm a little bit  
8 confused. If Mr. Soper could --

9 JUDGE FARRAR: Mr. Soper would you  
10 elaborate on that, please.

11 MR. SOPER: Yes. And I see the reason  
12 for the confusion and it's my fault. I said  
13 paragraphs -- it's actually pages 84, 85 and 86 of  
14 the Exhibit N, the crash report.

15 MR. GAUKLER: That's Section 11, Your  
16 Honor, which I read we will not be introducing.

17 JUDGE FARRAR: That you would not be  
18 introducing that?

19 MR. GAUKLER: Would not be introducing  
20 that in accordance with the Board's order  
21 yesterday, so there's no dispute with that one.

22 MR. SOPER: The next would be,  
23 paragraphs two and three. In other words, the  
24 second and third paragraphs on page 37, for the  
25 same reason.

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1 MR. SILBERG: I'm sorry, are you  
2 referring to page 37 of the crash report or of the  
3 testimony?

4 MR. SOPER: Of the crash report,  
5 Exhibit N again.

6 MR. GAUKLER: What page are those,  
7 Mr. Soper? Your Honor, I would suggest that since  
8 we agreed to take out certain things, why don't I  
9 work with counsel for the State, and I think  
10 there's going to be a lot of areas where there's  
11 agreement, at least in our view, and don't have to  
12 be focused, at least in terms of taking out things  
13 that relate to impacts which are excluded by the  
14 Board's order of yesterday.

15 MR. SOPER: I'd be happy to do it that  
16 way, Your Honor. If there's an event of a  
17 failure, we'll raise it again.

18 JUDGE FARRAR: Right. And Mr. Gaukler,  
19 since those are your deletions, if Mr. Soper  
20 starts cross-examining on matters that he didn't  
21 catch that you've deleted but you know you deleted  
22 them, please remind all of us.

23 MR. SOPER: May I just state for the  
24 record, Your Honor, that the -- to identify those  
25 pages that I'm referring to, they were pages 37,

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1 paragraphs two and three of the revised addendum  
2 to the crash report. That has not been offered  
3 yet, though, is that right? Is that Exhibit O?

4 MR. GAUKLER: Has not been offered.

5 MR. SOPER: Has not been offered.

6 MR. SILBERG: But it will be.

7 MR. GAUKLER: Before -- I forgot to say  
8 one thing. We have a supplement to go with the  
9 prefile testimony of General Cole, General  
10 Jefferson and Colonel Fly, which is the attachment  
11 that we had in our response to motion in limine  
12 which identifies the witnesses responsible for  
13 each of the questions. And we would just like to  
14 have that added at the end of the testimony.

15 JUDGE FARRAR: Not as an exhibit, but  
16 just attached to the testimony?

17 MR. GAUKLER: The testimony itself.

18 JUDGE FARRAR: And bound in the record  
19 right there?

20 MR. GAUKLER: Yes.

21 JUDGE FARRAR: All right. Any  
22 objection?

23 MS. MARCO: No objection.

24 MR. SOPER: No objection.

25 JUDGE FARRAR: Thank you.

1 MR. SOPER: That's all I have on what's  
2 been offered so far, Your Honor.

3 JUDGE FARRAR: All right, then subject  
4 to the objection on page 112 that we're carrying  
5 with the case, there's no objection to the  
6 admission of the acceptance of the testimony and  
7 the admission of the crash report? All right,  
8 then, let them be introduced.

9 MR. GAUKLER: We would like to now  
10 introduce the revised addendum to the crash impact  
11 hazard dated July 20, 2001, and as PFS Exhibit O,  
12 and I will state that again, we would have to --  
13 we will mark this up again and delete accordingly  
14 and provide copies as actually filed -- as  
15 actually filed with the court. We'd like to have  
16 this marked for the time being.

17 JUDGE FARRAR: Subject to that caveat,  
18 any objection to that?

19 MS. MARCO: No.

20 MR. SOPER: We have objections to the  
21 revised addendum, Your Honor.

22 JUDGE FARRAR: All right.

23 MR. SOPER: May I just place them on  
24 the record. If we can resolve it, then --

25 JUDGE FARRAR: Let's get it marked

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1 first.

2 MR. SOPER: Okay.

3 (EXHIBIT-O MARKED.)

4 JUDGE FARRAR: You were about to state  
5 an objection, Mr. Soper?

6 MR. SOPER: Yes, as to Exhibit N,  
7 the --

8 JUDGE FARRAR: Exhibit O.

9 MR. SOPER: Excuse me, Exhibit O, thank  
10 you. On page 37, the second and third paragraph,  
11 we object to, and on page 38 of Exhibit O,  
12 paragraphs one and two, the State objects to.

13 JUDGE FARRAR: Hold on while I get our  
14 copy of that.

15 MR. SILBERG: Mr. Chairman, we believe  
16 this will be taken care of in the same way, we'll  
17 go over it. These are sections which I think will  
18 be deleted. If there's a problem after the  
19 deletion, Mr. Soper can come back and we'll argue  
20 about it, but I think it be resolved.

21 JUDGE FARRAR: All right.

22 MR. GAUKLER: Except for the one  
23 paragraph here is identical to the one paragraph  
24 you've taken under consideration with respect to  
25 the testimony. So once you rule on that, it

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1 should be resolved.

2 JUDGE FARRAR: Okay. Then we'll carry  
3 that along till we get it straightened out.

4 MR. SOPER: Thank you.

5 MR. SOPER: The State has no more  
6 objections on O.

7 JUDGE FARRAR: All right, that will be  
8 admitted.

9 MR. GAUKLER: I'd like to move for the  
10 admission of Exhibit P, which is the map of the  
11 Utah Test & Training Range that you see up there  
12 on the chair. I'd like to have it marked.

13 JUDGE FARRAR: Is that the same map we  
14 had a year or so ago?

15 MR. GAUKLER: The same map that was  
16 filed with the Motion for Summary Disposition,  
17 yes.

18 (EXHIBIT-P MARKED.)

19 JUDGE FARRAR: The map that's been  
20 marked as Exhibit P, Mr. Gaukler, did you offer  
21 that?

22 MR. GAUKLER: Yes, I offer that into  
23 evidence.

24 JUDGE FARRAR: Any objection.

25 MR. SOPER: Could I see it, Your Honor?

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1 Well, ours doesn't have the site identified on it.  
2 I just wondered if the exhibit that's going in the  
3 record does? Is this the exhibit here?

4 JUDGE FARRAR: Yes.

5 MR. SOPER: May I approach and take a  
6 look?

7 JUDGE FARRAR: Certainly. Off the  
8 record.

9 (A discussion was held off the record.)

10 MR. GAUKLER: Next, I'd like to  
11 introduce --

12 MR. SOPER: Well, if I might just  
13 finish on that. The State having looked at it,  
14 and Counsel's representation that the PFS site is  
15 not on that map, we have no objection.

16 JUDGE FARRAR: All right. Ms. Marco.

17 MS. MARCO: No objection.

18 JUDGE FARRAR: Then that will be  
19 admitted, Exhibit P.

20 MR. GAUKLER: We'd next like to  
21 introduce the exhibits, the remainder of the  
22 exhibits that we had identified in our prefile  
23 testimony. These are first of all copies of  
24 graphs of -- Exhibit Q, graph of F-16 --

25 JUDGE FARRAR: Mr. Gaukler, read these

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1 slowly, because when you get into stuff like this,  
2 it's a little hard for the court reporter and  
3 everybody to follow it.

4 MR. GAUKLER: Exhibit Q, the graph of  
5 F-16 flight hours along with the related chart of  
6 aircraft failure rate over time. The Exhibit R,  
7 the same type of graph with respect to the F-16A.  
8 Exhibit S, the same type of graph showing both  
9 flight hours and a chart with the failure rates  
10 over time of the F-15A. Exhibit T, the same type  
11 of graph with respect to the F-106. Exhibit U,  
12 the same type of graphs with respect to the F-111.  
13 Exhibit V, the same type of graphs with respect to  
14 the F-4. Then Exhibit W, which is a summary from  
15 the Utah Test & Training Range with respect to  
16 climate conditions. Exhibit X, which is table  
17 one, I believe, from tab H of the air crash report  
18 as marked up by Lieutenant Colonel Horstman at his  
19 deposition of July 27, 2001. And Exhibit Y, which  
20 is an excerpt of the deposition of Lieutenant  
21 Colonel Hugh Horstman describing the table as  
22 marked up.

23 JUDGE FARRAR: And these are the same  
24 exhibits you sent out with your prefile testimony?

25 MR. GAUKLER: They're the same except

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1 that with respect to the graph of the F-16A, we've  
2 had a graph in there for the F-16 by mistake and  
3 we've corrected that in what we're providing to  
4 the Board and the parties today.

5 JUDGE FARRAR: Then let's have those  
6 marked. This will take a moment, so let's take a  
7 break in place.

8 (EXHIBITS-Q THROUGH Y MARKED.)

9 JUDGE FARRAR: Back on the record, if  
10 we could. Back in order. And no cell phones,  
11 please. Oh, it's not a cell phone, it's a guard.  
12 I'm glad there's not a film crew in here, because  
13 the last 15 minutes might have looked like one of  
14 those old time movies with the cars just missing  
15 each other. But believe it or not, we're making  
16 progress with the system here, and appreciate  
17 everyone's effort in that regard.

18 Let's make sure on the exhibits that  
19 from now on and in short order on the ones that  
20 have already been admitted, that we have three  
21 copies, because while I can't name where in the  
22 commission all three of those go, I cannot be  
23 fired for the decisions I write, but I can be  
24 fired for not bringing home three copies of the  
25 exhibits. So...

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1 MR. GAUKLER: If there's no objection,  
2 we move for the admission of the exhibits I just  
3 identified, which are PFS Q through PFS Y.

4 JUDGE FARRAR: Any objection?

5 MS. MARCO: No.

6 MR. SOPER: The State has no objection,  
7 Your Honor.

8 JUDGE FARRAR: Those will be admitted,  
9 then. Thank you.

10 MR. GAUKLER: I would like to introduce  
11 two exhibits that were not part of our prefile  
12 exhibits, and they are just basically blowups of  
13 the map that you see up on the chair there. And  
14 so they're just blowups of Exhibit P, but I think  
15 they should be marked separately.

16 JUDGE FARRAR: Right.

17 MR. GAUKLER: I'd like to introduce the  
18 map from Hill Air Force Base to -- down to Michael  
19 Army Airfield, and I would propose to mark that as  
20 PFS Exhibit Z to replace the Exhibit P that we are  
21 not introducing because of the board's order.

22 JUDGE FARRAR: Oh, okay. Well --

23 MR. GAUKLER: Or do you want to do it  
24 differently? Let's do it differently, yeah.

25 JUDGE FARRAR: Yeah, just because

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1 people will go back to that prefile testimony,  
2 they'll see an Exhibit Z there and they'll be  
3 confusing down the road.

4 MR. GAUKLER: Then let's go to our next  
5 exhibit, which I believe is Exhibit -- no, we've  
6 used a lot of exhibits on the seismic contentions,  
7 and so I think we're at Exhibit --

8 MS. CHANCELLOR: K.

9 MR. GAUKLER: KKK.

10 JUDGE FARRAR: No.

11 MR. GAUKLER: KKK.

12 JUDGE FARRAR: That won't do,  
13 Mr. Gaukler.

14 MR. GAUKLER: Shall we skip that one?

15 JUDGE FARRAR: Okay. You were using  
16 triple letters on the seismic?

17 MR. GAUKLER: Yes, we're into triple  
18 letters, and my staff advises me that we were up  
19 to -- JJJ was the last one that we just filed.

20 JUDGE FARRAR: Well, we're not in  
21 Washington, so we don't have to be politically  
22 correct. Let's do KKK.

23 MR. GAUKLER: Okay. And then I would  
24 like to introduce the second one, that is a  
25 further blowup, this is focusing on Skull Valley,

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1 as Exhibit LLL. And I would note for the record,  
2 there's a faint X on these two exhibits where the  
3 site is located.

4 MS. MARCO: I'm sorry, can we go over  
5 that? Is this LLL?

6 MR. TURK: Can we go off the record,  
7 please.

8 JUDGE FARRAR: Off the record.

9 (A discussion was held off the record.)

10 JUDGE FARRAR: Mr. Turk, that was a  
11 good suggestion off the record. Let's -- where we  
12 have arguments let's do them on record. Where we  
13 have confusion, let's do them off the record and  
14 try to follow that practice as we go along. Go  
15 ahead, you need to mark those.

16 (EXHIBITS-Z, KKK & LLL MARKED.)

17 JUDGE FARRAR: Back on the record.

18 MR. GAUKLER: Having been identified, I  
19 would offer them into evidence.

20 JUDGE FARRAR: Any objection to these,  
21 to KKK and LLL?

22 MS. MARCO: No objection.

23 MR. SOPER: We have no objection, Your  
24 Honor.

25 JUDGE FARRAR: Then these will be

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1 admitted. Now, we're ready to go?

2 MR. GAUKLER: We would like to have  
3 Mr. Vigeant's testimony.

4

5 DIRECT EXAMINATION

6 BY MR. GAUKLER:

7 Q. You have before you a copy of a  
8 document, Mr. Vigeant, entitled Testimony of  
9 Stephen Vigeant on Aircraft Crash Hazards at the  
10 PFSF Contention Utah K/Confederated Tribes B?

11 A. I do.

12 Q. And that document is dated February 19,  
13 2002?

14 A. Yes, it is.

15 Q. And could you tell me how many pages it  
16 comprises?

17 A. It comprises 10 pages.

18 Q. Plus your resume?

19 A. Plus my resume.

20 Q. This is the testimony that you prepared  
21 or was prepared under your supervision and  
22 direction?

23 A. Yes, it is.

24 Q. Do you have any changes to make to your  
25 testimony?

1 A. No, I don't.

2 Q. Do you accept and adopt your testimony  
3 as your testimony in this proceeding?

4 A. I do.

5 Q. Is it true and correct, to the best of  
6 your knowledge?

7 A. It is.

8 MR. GAUKLER: I would offer the  
9 testimony of Mr. Stephen Vigeant as read into the  
10 record.

11 JUDGE FARRAR: Any objection?

12 MS. MARCO: No objection.

13 MR. SOPER: No objection, Your Honor.

14 JUDGE FARRAR: Then the testimony will  
15 be accepted in the record.

16 JUDGE FARRAR: Do you have copies,  
17 Madame Reporter?

18 COURT REPORTER: No.

19 MR. GAUKLER: I don't have them right  
20 at this point. We left them over at the other  
21 place.

22 JUDGE FARRAR: Moving from one -- which  
23 is one reason we tried to get meeting rooms in the  
24 same place for the six weeks. We were  
25 unsuccessful, and this is one of the disadvantages

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1 of that, as you're moving from place to place.  
2 But don't let me down, Mr. Gaukler, in not getting  
3 these to the reporter.

4 All right. Those already -- I think we  
5 already said will be accepted.

6 MR. GAUKLER: And be accepted in the  
7 transcript as read?

8 JUDGE FARRAR: Correct.

9 MR. GAUKLER: I offer the witnesses  
10 then for cross-examination.

11 JUDGE FARRAR: Okay.

12 MS. MARCO: I understand the Staff  
13 proceeds first with this cross-examination, and I  
14 do not have a lot of cross-examination for these  
15 witnesses, but I do have some.

16 JUDGE FARRAR: Okay, go ahead  
17 Ms. Marco.

18 MS. MARCO: Thank you.

19 JUDGE FARRAR: Wait, wait, wait. I'm  
20 sorry, Mr. Gaukler. We had said at the beginning,  
21 it would help us before we start to just get some  
22 of the terms -- you know, some of the geography  
23 down, and you know, just a short tutorial, not  
24 argumentative, but just when you refer to this  
25 flight pattern.

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1 MR. GAUKLER: I would like to ask  
2 Colonel Fly to do that.

3 JUDGE FARRAR: And --

4 MR. GAUKLER: I think it would be  
5 easier if he referred to the map up there.

6 COLONEL FLY: Would you like me to move  
7 it where you can see it, Your Honor or --

8 JUDGE FARRAR: Do you all want the  
9 benefit of this, also? Why don't we put the map  
10 out in the circle here and we'll all gather  
11 around, and can you hear us without microphones?

12 Can we do this off the record, so that  
13 we can ask questions back and forth and she  
14 doesn't have to get it down?

15 MR. SOPER: Well, I'm not sure what's  
16 about to come here. This is testimony or is this  
17 just --

18 JUDGE FARRAR: No, this is --

19 MR. SOPER: Informational?

20 JUDGE FARRAR: Informational.

21 JUDGE KLINE: This is a tutorial.

22 JUDGE FARRAR: Just so we understand  
23 the terms and the areas they're referring to and  
24 don't have to constantly interrupt their  
25 testimony. Let's do it off the record.

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1 (A discussion was held off the record.)

2 JUDGE FARRAR: Back on the record.

3 We've just done something a little unusual.

4 Colonel Fly has shown me -- has done for the Board  
5 and for counsel for all the parties, a little  
6 tutorial on the map just so that as he goes -- as  
7 the panel goes through the cross-examination, we  
8 will understand what the different terms are, what  
9 the different areas were, what the different  
10 flight paths are. I would ask the panel as they  
11 answer the questions, we wanted to have all that  
12 at once at the beginning so we weren't here not  
13 understanding and having to constantly interrupt.  
14 But to the extent you can, as you answer the  
15 cross-examination, you can build in elements from  
16 the tutorial. Don't assume that we know this  
17 stuff as intuitively as you do or as the public  
18 watching knows it. So now that we have an  
19 overview, please try where you think it's  
20 appropriate, to work elements of that tutorial  
21 into the testimony. Nothing that was just done  
22 off the record is evidence. Anything that -- it's  
23 not part of the record, so we'll proceed on that  
24 basis.

25 Mr. Gaukler, I think you had tendered

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1 the panel for cross-examination, and Ms. Marco,  
2 you had gotten about three seconds into your  
3 cross-examination when we interrupted you.

4 MS. MARCO: Thank you.

5

6 CROSS EXAMINATION

7 BY MS. MARCO:

8 Q. Hello, my name is Catherine Marco, and  
9 I represent the NRC Staff, as I said before. And  
10 I have questions first concerning Question 45 of  
11 your testimony, please.

12 MR. SILBERG: Just to clarify, you're  
13 referring to the testimony of Generals Cole,  
14 Jefferson and Colonel Fly?

15 MS. MARCO: Yes. Yes, I am.

16 Q. (By Ms. Marco) In question 45, you  
17 speak of the small effort required for a pilot to  
18 avoid the PFS site in the event of an emergency.  
19 Can you please describe what that small effort  
20 consists of?

21 COLONEL FLY: Yes, ma'am, I'd be happy  
22 to. The site itself is about 1500 by 1200 feet.  
23 The pilots -- if we operate from the assumption  
24 that the engine failure is the most likely cause  
25 of the accident, and the pilot goes through all

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1 the prescribed procedures in order to attempt to  
2 restart the airplane, he will at some point -- and  
3 it depends what he -- where he was at the  
4 initiation of the sequence, but he will at some  
5 point pick up a nose load decent of about six  
6 degrees, and this is to preserve an air speed  
7 consistent with the prescribed emergency  
8 procedures. It's a trade-off between the time  
9 aloft and time required for the engine to restart  
10 and spool up and get up to useful thrust. And  
11 also to keep the engine spooling, because you need  
12 the airflow going through. You don't -- anyway,  
13 at the six degree glide path, his minimum  
14 recommended emergency or ejection altitude for a  
15 controlled situation, meaning that the pilot has  
16 control of the airplane, is 2000 feet AGL. So if  
17 you back that out, that's going to put him several  
18 miles out away from the impact point, wherever it  
19 is. So if you bring a pilot to that point, which  
20 would be his minimum -- as close as he wants to  
21 get, as late as he should eject, and assume that  
22 the airplane is pointed right in the middle of the  
23 proposed storage facility, he's going to need to  
24 turn about three or four degrees at the most to  
25 point the aircraft off to the side into the dirt

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1 areas.

2 Q. And that would be pulling a handle down  
3 or --

4 COLONEL FLY: The side stick controller  
5 in the F-16 its -- if you can imagine yourself --  
6 for the court recorder, sits off to the right-hand  
7 side, kind of like the chair of an arm. That's  
8 sort of where it is. It's a side stick  
9 controller, unlike the conventional stick that you  
10 see in most fighter aircraft. It's just a -- it's  
11 about the size of this microphone stand, actually,  
12 a little thicker than that. And the pilot  
13 controls the airplane by moving that. So in this  
14 case, he would just have to turn the aircraft a  
15 little bit left or right in order to point the  
16 aircraft away from the site.

17 Q. And then if he wanted to eject, he  
18 would push the ejection handle; is that correct?

19 COLONEL FLY: You actually pull it.  
20 It's between your legs and it's a yellow handle  
21 D-shaped, and you just reach in and pull it like  
22 that.

23 Q. Okay. Now, my other question also  
24 concerns question No. 45. In the question -- in  
25 the answer to the question, you say that there are

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1 flight characteristics of F-16s that would enable  
2 a pilot to direct the aircraft away from the  
3 facility. What are those flight characteristics  
4 that you talk about there?

5 COLONEL FLY: That goes toward the way  
6 the airplane was designed with what's called a fly  
7 by wire, where the computers fly it. Normally,  
8 you will fly the airplane in what's called a 1G,  
9 which is level flight, if you will. In a case  
10 like this where you don't have enough thrust to  
11 keep your air speed because the engine's quit, the  
12 airplane -- the computers are -- the way it  
13 normally works is the flight control computers  
14 will keep as you have slowed the airplane down to  
15 this 200, 210 knots, somewhere in there, speed,  
16 the flight control computers will do a thing  
17 that's called increasing your angle of attack, and  
18 I don't want to bore you with the aeronautical  
19 terms, but until it gets to about 11 degrees, the  
20 airplane would try to hold level flight and then  
21 it's just going to continue -- it will maintain  
22 that angle of attack, and it will descend, but it  
23 will be nice and stable because the computers are  
24 doing that. So when you jump out under conditions  
25 like that, the airplane tends to just continue

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1 going where it was and hit about where you headed,  
2 where it was pointed when you jumped out.

3 MS. MARCO: Okay. I don't have any  
4 further questions.

5 JUDGE FARRAR: Before the State begins.  
6 In your answer, you said a six degree glide path.  
7 Why did you use that?

8 COLONEL FLY: Because the airplane, the  
9 technical order of the procedures tell you to  
10 maintain an air speed that varies depending on how  
11 much fuel you have on board and things like that.  
12 It will be about -- your air speed is going to  
13 be -- it could be as low as 170, could be as high  
14 as 210, 215, somewhere in there. But the six  
15 degrees is based on experience. That's what it  
16 takes without an engine running to maintain that  
17 air speed, that kind of a glide path. It could be  
18 a little less, it could be a little low, but six  
19 degrees is a good workable number.

20 JUDGE FARRAR: So that's not something  
21 you choose, that's something that you want to do?

22 COLONEL FLY: To maintain the air speed  
23 in accordance with the established procedures,  
24 yes, Your Honor.

25 JUDGE LAM: Now, you meant when the

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1 airplane loses all engine power, it will glide?

2 COLONEL FLY: Yes, it will. It will go  
3 typically for every 5,000 feet of altitude, a  
4 clean F-16 will glide about seven miles.

5 JUDGE LAM: Uh-huh. And also in your  
6 response to Ms. Marco, you sort of implied the  
7 failure mode that you had considered as engine  
8 failure; is that correct?

9 COLONEL FLY: In the description I gave  
10 her, yes, it is, Your Honor.

11 JUDGE LAM: So the other modes of  
12 failure, whatever they may be, were not included  
13 in your discussion?

14 COLONEL FLY: If I could perhaps expand  
15 on that a little bit. I gave that because that is  
16 far and away the most likely event to cause  
17 something to happen like that. But in almost any  
18 case of a failure of the F-16, if the airplane is  
19 under control, the same thing would -- the same  
20 kind of thing would happen. In many cases, you  
21 have an emergency where you may have any one of a  
22 number of different malfunctions where the  
23 airplane is still flyable and if you've got usable  
24 thrust of the engine, now you can go to Michael  
25 Army Airfield or return to Hill, or you have other

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1 options in terms of flying the airplane.

2 JUDGE LAM: Thank you.

3 JUDGE FARRAR: One last question. I  
4 seem to remember from somewhere that years ago you  
5 all were trying to develop an ejection seat that  
6 could be used at much lower altitudes. Did that  
7 never work?

8 COLONEL FLY: Actually, Your Honor, the  
9 ACES II, which is the one that we use in the F-16,  
10 is probably the most capable ejection seat going  
11 right now. It's far better than what I flew in  
12 the F-4 and the F-5 and some of the other fighter  
13 aircraft. And, in fact, as a result of the  
14 success of the seat, the Air Force lowered -- I  
15 talked about the 2000 feet minimum ejection  
16 altitude. It used to be 10,000 feet, if you were  
17 out of control. And those were all AGL altitudes.  
18 Because of the success and the capabilities of  
19 ACES II, that was lowered to 6500 feet. And it's  
20 also what we call a zero/zero seat; zero air  
21 speed, zero altitude. You can literally be  
22 sitting on the runway, just for something to do,  
23 pull the ejection handle, and you'll go and it  
24 will give you a good parachute and it will  
25 function normally.

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1 JUDGE FARRAR: But notwithstanding  
2 that, your recommendation to the pilots is 2000?

3 COLONEL FLY: That is the minimum  
4 recommended ejection altitude for controlled  
5 situations in the appropriate Air Force technical  
6 manuals.

7 MR. GAUKLER: Colonel Fly, you use the  
8 acronym, I believe ACES. Could you spell that for  
9 the reporter.

10 COLONEL FLY: A-C-E-S, Roman numeral  
11 two. And I don't know what ACES stands for. It's  
12 just the ACES II seat.

13 JUDGE KLINE: One more before we quit  
14 here. I understand from your testimony that when  
15 the aircraft gets a -- a failing aircraft gets  
16 down to the level where the pilot feels it's  
17 imperative to depart, the uncontrolled aircraft  
18 then is several miles away from its impact point;  
19 is that correct?

20 COLONEL FLY: In the situation that I  
21 described for Mrs. Marco, yes, Your Honor.

22 JUDGE KLINE: Okay. So the issue that  
23 I would like to explore then is not whether he  
24 could redirect the aircraft before he departs, but  
25 why would he? I mean how does he maintain

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1 awareness of where this small site is under  
2 emergency conditions?

3 COLONEL FLY: Your Honor, there are a  
4 couple of things that would I think come to play.  
5 One is typically in the head-up display, which is  
6 the -- it's a glass that sits in front of the  
7 pilot where there's all sorts of different pieces  
8 of information displayed. One of the things you  
9 have is what's called a flight path marker and the  
10 flight path marker says this is where the airplane  
11 is pointed. If the flight path marker is on a  
12 building, that means you're pointed at that  
13 building, and it's very accurate. If you turn to  
14 put the flight path marker off of the building and  
15 roll back out and now you're pointed out in the  
16 dirt, the airplane is going to hit about where  
17 that thing is. The airplane is actually very  
18 stable. The only problem with it would be the  
19 fact that you've got no usable thrust, and you  
20 can't maintain flight.

21 JUDGE KLINE: So you have a positive  
22 means, then, for identifying ground features that  
23 need to be avoided?

24 COLONEL FLY: Well, you can see what's  
25 out in front of you, and you know where the

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1 airplane is pointed.

2 JUDGE KLINE: Yeah.

3 COLONEL FLY: So you have a very good  
4 idea of where the airplane will impact after you  
5 jump out.

6 JUDGE KLINE: So he doesn't -- what I'm  
7 trying to get at is that the pilot doesn't have to  
8 maintain some sort of predetermined awareness  
9 necessary of where this ground feature is? I mean  
10 he's getting some sort of information stream as to  
11 where these features are; is that correct?

12 GENERAL COLE: May I add a little bit,  
13 sir?

14 JUDGE KLINE: Yeah, please do.

15 GENERAL COLE: The pilots are trained  
16 nearly since birth to maintain constant  
17 situationally and positionally awareness, and so  
18 regardless of where they are and where they're  
19 going, they have a fairly good mental picture of  
20 their vector features in the area, and if they do  
21 have an emergency like that, if they're in a  
22 totally uninhabited, unpopulated area with no  
23 structures, where the airplane is going to land is  
24 not much of a concern. But as Colonel Fly so  
25 accurately pointed out, they do know where it's

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1 going to land, and because of this positional and  
2 situational awareness of there is something out  
3 there that it would not be good to have the  
4 airplane land on, they will adjust the heading one  
5 way or another to ensure that it doesn't before  
6 they eject.

7 JUDGE KLINE: Okay, let me just follow  
8 up with a hypothetical, then.

9 JUDGE FARRAR: Wait a minute. They  
10 will or they can?

11 GENERAL COLE: Will and can, sir, or  
12 can and will.

13 JUDGE KLINE: If someone asked you to  
14 make the same calculation that was made for the  
15 PFS site as to probability of striking the site in  
16 a crash situation, you could use much the same  
17 technology if you had to, or much the same  
18 equation if you had to, to calculate probability  
19 of striking, say, a Goshute structure, say the  
20 Village Hall or the farm buildings that are out in  
21 Skull Valley; is that correct? And would you use  
22 the same correction factor or the same --

23 GENERAL COLE: You would use the same  
24 procedure and technique, yes, sir.

25 JUDGE KLINE: So you're saying, then,

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1 that the pilot maintains not only situational  
2 awareness of the facility we're interested in, but  
3 he has a general kind of situational awareness  
4 that says, I know where the farm buildings are, I  
5 know why the Goshute haul is, I know where  
6 individual houses are?

7 GENERAL COLE: That's correct, sir.  
8 Some things obviously that are larger and more  
9 prominent are easy to instantly identify than  
10 others, but that's correct.

11 JUDGE KLINE: All right.

12 JUDGE FARRAR: Mr. Soper, your turn.

13 MR. SOPER: Thank you, Your Honor.  
14 Your Honor, could you instruct the panel not to  
15 confer before their answer? When we ask a  
16 question, we'd like that panel member's response,  
17 not another panel member's response.

18 JUDGE FARRAR: Before I instruct them  
19 that way, I'll ask other counsel whether they  
20 think that's a good instruction?

21 MR. GAUKLER: I don't think that's a  
22 good instruction. First of all, because we have  
23 identified the certain issues and questions, the  
24 person that's primarily responsible for that  
25 question, and in other respects, we receive the

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1 identification of all. This was in many respects  
2 a joint review that was done by them as a group  
3 where they brought their individual expertise  
4 together and each contributed their expertise to  
5 the final decision and final evaluation. So to  
6 say that you're going to just direct the question  
7 at one, I don't think is fair or appropriate, in  
8 terms of the way the report was done, nor do I  
9 think it's the most efficient way to provide the  
10 information to the Licensing Board.

11 JUDGE FARRAR: Ms. Marco?

12 MS. MARCO: I don't think you would get  
13 very quality -- a lot of weight to the response if  
14 it's directed to somebody who wasn't the sponsor  
15 of the question.

16 MR. SOPER: Well, that's exactly what  
17 I'm worried about, Your Honor. This being  
18 cross-examination, it's my understanding it's  
19 always been, as I suggest, that each of these  
20 witnesses has sworn to each answer. You'll notice  
21 that the Applicant was very adamant that it did  
22 not, even though I requested that they be  
23 identified, that this is only the testimony of one  
24 Applicant -- or excuse me, one panel member or  
25 another. They refused to do that, and they simply

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1 said, there's a primary responsible person, not in  
2 all of them, but only on some, but they did not  
3 withdraw their answers. They answered each  
4 question, each panel member, and they swear to it.  
5 Now, I want to know each panel member's experience  
6 that he swears to on that question without getting  
7 the response from a different panel member. I  
8 mean this was my whole point of my objection, and  
9 it's been denied, and so unless they withdraw  
10 their testimony as to certain questions, I'm  
11 entitled to examine that panel member on his  
12 answer.

13 MR. TURK: May I offer a comment, Your  
14 Honor?

15 JUDGE FARRAR: Yes.

16 MR. TURK: In practice that I've had  
17 previously, I think it's fair to ask the witness  
18 who is primarily responsible for his answer. But  
19 I also instruct the witness that if he feels the  
20 need to consult beforehand, to please state that  
21 and then we would allow them to consult. And so  
22 that it's clear on the record whether it's his own  
23 answer or it's a consultative response.

24 MR. GAUKLER: And I believe it would be  
25 appropriate to allow, since there was a group

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1 effort, to allow another witness to add something  
2 to an answer that the previous witness gave.

3 MR. SOPER: That's what redirect is  
4 for.

5 JUDGE FARRAR: Let me consult with my  
6 colleagues here.

7 (A discussion was held off the record.)

8 JUDGE FARRAR: Mr. Soper and other  
9 counsel, let me see if I can state a general rule  
10 to guide us on this type of thing for the rest of  
11 the proceeding, subject to departure when  
12 appropriate. It seems to us, you're entitled to  
13 get an answer from a witness -- from the witness  
14 you ask the question of, but if you ask someone a  
15 question, that witness is entitled to say, I'm --  
16 I really don't know, you know, that was the  
17 panel's discussion -- that was the panel's  
18 prepared testimony, but I'm not really -- I don't  
19 really have expertise. In fact, I think as a  
20 general matter, we would prefer -- I mean a lot of  
21 people don't like to say I don't know. They think  
22 it shows their ignorance. I always think it shows  
23 their intelligence. If you don't know the answer,  
24 you don't -- if you're not the expert, say I'm not  
25 the expert and then you can ask someone else. I

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1 did notice on one occasion, one gentleman was  
2 answering and it looked like the person next to  
3 him wanted to say something. I, like you, would  
4 like to hear what the one says, then I'd like to  
5 hear what the other one said, and then if they  
6 want to consult and -- which, you know, we do up  
7 here, two heads are better than one, they can do  
8 that also. But I think you're correct to the  
9 extent that you are entitled to get an unvarnished  
10 answer from one person, but then that person,  
11 rather than hold it for redirect, we would prefer  
12 that the other person who wants to say something  
13 also chime in.

14 Now, I understand your thing is a  
15 matter of strategy. You'd like to have your  
16 answer on there and maybe a day later, you know,  
17 we come back and do redirect. That's not how our  
18 brains work up here. Remember at the end of this,  
19 we have to write a decision that analyzes the  
20 evidence, and as you just saw, when we followed up  
21 -- you know, Ms. Marco had a very short  
22 examination, we followed up, and I was concerned  
23 about taking -- you know, interfering with your  
24 cross. But we don't want things to get down the  
25 road and we forget to do the follow-up and we get

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1 back to the office this summer and there's  
2 something we wish we'd ask a question on, because  
3 we can't write a decision without that answer.

4 So if that's -- I think I just said  
5 your point is well taken, but subject to those  
6 qualifiers.

7 MR. SOPER: That would be a second  
8 witness could answer the question afterwards?

9 JUDGE FARRAR: Right. But I think we  
10 would prefer no consultation first. But don't  
11 hesitate, gentlemen, you know, if you don't know  
12 the answer, don't make it up. If you don't know,  
13 you know, say you don't know. And you can even  
14 volunteer that somebody else at the table knows  
15 that subject far better than you do. And I think  
16 in this type of proceeding, where we have experts,  
17 the credibility that's at stake is your expertise,  
18 not your -- you know, it's not like an ordinary  
19 criminal trial where we think somebody is lying.  
20 We're looking for the person -- we assume the  
21 answers you give are going to be the best of your  
22 ability and we -- so that's what we're looking  
23 for. Go ahead, Mr. Soper.

24 MR. SOPER: Thank, Your Honor. I was  
25 just consulting here.

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1 JUDGE FARRAR: I caught you, I caught  
2 you. But let's try to follow that general rule,  
3 and if it doesn't fit in a particular case,  
4 counsel is free to argue the point. But let's  
5 proceed on that basis.

6 MR. SOPER: Thank you, Your Honor.

7  
8 CROSS EXAMINATION

9 BY MR. SOPER:

10 Q. For the panel members, my name is Jim  
11 Soper. I represent the State of Utah here, and  
12 I'm the assistant Utah Attorney General, and good  
13 afternoon.

14 I would like just to follow up on a  
15 question that Judge Kline asked, and Colonel Fly,  
16 if I might inquire. There seems to be some  
17 confusion about what a heads-up display does. It,  
18 in fact, does not keep track of any ground  
19 facilities such as a ranch or the PFS site or  
20 anything else? It doesn't track those for the  
21 pilot, does it?

22 COLONEL FLY: As I said, the heads-up  
23 display just provides different information.  
24 Normally, in the head-up display, there is one  
25 piece of, if you will, location information that's

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1 displayed, and that would be coincident with there  
2 is a navigation system where you load different  
3 steer points, and around the steer point you do  
4 get a TD box with a little dot in it that shows  
5 you this is the selected steer point that you  
6 have. The other information doesn't necessarily  
7 talk to those specific things. What I said to the  
8 judge, I believe was, the pilot can see  
9 everything -- the pilot sees what's in front of  
10 him and on the heads-up display, the flight path  
11 marker is one of the things that would show him  
12 where the aircraft is pointed, not necessarily  
13 where every building is in the general area.

14 Q. Does it show any building?

15 COLONEL FLY: As I said, it shows what  
16 the --

17 Q. Does the heads-up display show any  
18 building?

19 COLONEL FLY: That depends what he has  
20 selected for his steer point.

21 Q. Will it be a picture over the building?  
22 What will appear on there?

23 COLONEL FLY: It puts a projection, a  
24 TD box on the heads-up display that surrounds the  
25 selected steer point.

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1 MR. GAUKLER: Colonel Fly, if you could  
2 just say what a TD box is, it might help clarify.

3 JUDGE FARRAR: And let me --  
4 Mr. Gaukler anticipated me. Not to interrupt you,  
5 Mr. Soper. We hope we're great at our job, you're  
6 great at your job, but we don't understand what  
7 you're talking about.

8 COLONEL FLY: The HUD is a --

9 JUDGE FARRAR: Wait, wait.

10 COLONEL FLY: Oh, sorry.

11 JUDGE FARRAR: And counsel can instruct  
12 all their witnesses for the rest of the case.  
13 When you say heads-up display, we've all seen  
14 movies, but very few of us have been in planes and  
15 we don't know, you know, what that is. Is that  
16 like the little TV screen? In other words, when  
17 I'm looking out of the cockpit, I see something in  
18 front of me with my eyes, and I see something else  
19 that's displayed, but now I've exceeded my  
20 knowledge. Don't assume that anybody in the room  
21 knows when you say heads-up display what that  
22 means, so kind of take us through that.

23 JUDGE LAM: Colonel Fly, because none  
24 of us have sat in a cockpit.

25 COLONEL FLY: Okay, I apologize judge.

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1 In the F-16, there's a -- you've got all the  
2 cockpit instruments that are down here and then  
3 you've got a thing that's commonly referred to as  
4 a glare shield, which basically is just kind of --  
5 that's the box that all these different  
6 instruments are physically mounted in. That's a  
7 physical thing. On top of the glare shield,  
8 there's -- it's a thick -- the head-up display is  
9 mounted on top of the glare shield in the center  
10 of the glare shield. It's a thick piece of glass  
11 is what it physically is. Underneath the head-up  
12 display, in the glare shield, there's a projector  
13 that generates electronic imagery that is shown up  
14 from the bottom of the glare shield and projected  
15 onto the heads-up display. You get green  
16 symbology, all sorts of different stuff projected  
17 onto the heads-up display glass. You can see  
18 through the green marking, if you will, or the  
19 green images beyond and what's out in front of the  
20 airplane within the field of view of the heads-up  
21 display. The TD box I think -- this goes back to  
22 1981 when I first flew the airplane. I think it's  
23 the target detection box. I'm not exactly sure.  
24 But it's a square -- it's a green square that's  
25 projected onto the heads-up display that goes

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1 around where the on-board systems believe your  
2 selected steer point is. So you get -- if my  
3 steer point is that glass of water on the table,  
4 Your Honor, there would be a green box around  
5 that. The idea being that it can help me see --  
6 it helps me find my next point for navigation  
7 purposes.

8 Does that adequately answer the  
9 question or explain sort of what I was trying to  
10 say?

11 JUDGE KLINE: One more thing, then.  
12 The terms steer point is obscure to me, and would  
13 that be the same -- for example, assuming that  
14 we're in an aircraft about to crash, is the steer  
15 point the same as the projected impact point?

16 COLONEL FLY: No, Your Honor. The  
17 steer point is based on the planned route of  
18 flight. As you go -- if you can imagine a map  
19 that has different places -- routes of flight,  
20 each place the pilot is going to turn is a turn  
21 point or a steer point. That's programmed into  
22 the on-board system, the inertial navigation  
23 system and the pilot selects which steer point he  
24 wants to have. Typically, it's the next one along  
25 his planned route of flight. In the F-16, the

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1 standard practice is -- say you have eight turn  
2 points in your low level, you'll program those  
3 typically one, two, three, four, five, six, seven,  
4 eight, you can have much more than that, and  
5 typically, like starting at about steer point 20,  
6 they would load destination such as Michael Army  
7 Airfield, so that they would have ready reference  
8 to an emergency airfield, Wendover, back to Hill  
9 Air Force Base, they will load places that are  
10 commonly used that they want to be able to get to  
11 quickly and understand exactly where it is using  
12 their on-board systems. So the steer point is  
13 typically associated with the route of flight, and  
14 the pilot has the option of selecting whichever  
15 one he wants to.

16 JUDGE KLINE: Thank you.

17 JUDGE FARRAR: Mr. Soper.

18 Q. (By Mr. Soper) So depending on what  
19 steer point is put into the head-up display, the  
20 PFS site may or may not show up on it, is that  
21 your testimony?

22 COLONEL FLY: My testimony is if it's  
23 within the HUD field of view, it will be  
24 physically -- the PFS site would be within the --  
25 if it's within the HUD field of view, it's within

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1 the HUD field of view. If the pilot has selected  
2 that and programmed it as a steer point, and the  
3 pilot has selected the PFS site, that destination  
4 as his steer point, then there would be the TD box  
5 around the PFS site.

6 Q. And in which case you would be pointed  
7 directly at the PFS site, is that right?

8 COLONEL FLY: Not necessarily. The HUD  
9 field of view is 20 by 30 degrees.

10 Q. So close, in the same general area?

11 COLONEL FLY: Within about 15 degrees,  
12 that's correct. If it's within the HUD field of  
13 view, that's correct.

14 JUDGE FARRAR: Wait, HUD is heads-up  
15 display.

16 COLONEL FLY: Heads-up display, I'm  
17 sorry, Your Honor. That's that big combining  
18 glass that all the green imagery gets projected  
19 onto.

20 Q. (By Mr. Soper) The heads-up display  
21 goes off when the engine goes off, though; isn't  
22 that right?

23 COLONEL FLY: I'd have to go back and  
24 take a look at the emergency power generation.

25 Q. You don't know the answer to that?

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1 COLONEL FLY: No, you get some of it  
2 because I'm just thinking back to my emergencies  
3 where they failed in the simulator. You still get  
4 pitch bars and things like that.

5 Q. Actually, the pitch bars come on quite  
6 a bit later, the last thing to come back on when  
7 the engine goes off; isn't that true?

8 COLONEL FLY: Say that again, please.

9 Q. The pitch bars are the last thing to  
10 come back on on the HUD display when the engine  
11 goes off when you get power back? The HUD display  
12 requires electricity, doesn't it?

13 COLONEL FLY: Yes, it does.

14 Q. And that goes off when you lose an  
15 engine, doesn't it?

16 COLONEL FLY: It's a function that  
17 generate rpm and then you have the emergency --

18 Q. It goes off when you lose the engine,  
19 doesn't it?

20 MR. GAUKLER: I believe the witness  
21 should answer the question. I believe he was  
22 answering the question.

23 JUDGE FARRAR: No, let's keep going.

24 Q. (By Mr. Soper) The heads-up display  
25 goes off when the engine stops; isn't that right?

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1 COLONEL FLY: It blinks off when the  
2 main generator goes off, and it comes back as soon  
3 as the standbys come back on.

4 Q. So it's off for a period of time?

5 COLONEL FLY: Yes, for some small of  
6 amount of time.

7 Q. And the TD box --

8 COLONEL FLY: Maybe about a half a  
9 second, a second, I've never timed it. It shows  
10 back up fairly quickly. I can't give you a time,  
11 but it's very short.

12 JUDGE FARRAR: Mr. Soper, hold on.  
13 I'll let you be as persistent as possible, and as  
14 insistent as possible with your questions, but you  
15 have to give him time to answer.

16 MR. SOPER: Thank you, Your Honor.

17 Q. (By Mr. Soper) The TD box is not  
18 active in navigation mode; isn't that right? It's  
19 only active in bombing mode?

20 COLONEL FLY: You would have still a  
21 steer point select. There would be symbology up  
22 there for the steer point in the navigation mode.

23 Q. I would like a straight answer,  
24 Colonel.

25 COLONEL FLY: The straight answer is

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1 you will get HUD symbology --

2 Q. That wasn't my question.

3 JUDGE FARRAR: Wait a minute, he's not  
4 finished answering.

5 MR. SOPER: Could I get an instruction  
6 to have him answer my question and not another  
7 question, Your Honor?

8 JUDGE FARRAR: No, you can continue  
9 with following this very closely. If you don't  
10 think he's answered your question, ask it again.

11 COLONEL FLY: In the navigation mode,  
12 the pilot will get HUD symbology around his  
13 selected steer point, if the selected steer  
14 point -- if it was -- is within the heads-up  
15 display field of view. If it is too far left or  
16 too far right, if it's outside of the HUD field of  
17 view, the HUD symbology that shows where the pilot  
18 steer point is, will move in the direction of the  
19 steer point and a X will be presented -- will go  
20 over to say it's in this general direction, but I  
21 can't show you exactly where, because it's outside  
22 the HUD field of view.

23 Q. (By Mr. Soper) Okay, my question,  
24 listen very closely, please. The TD box is not  
25 active in navigation mode; yes or no?

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1 COLONEL FLY: I would have to check the  
2 terminology of the piece of HUD symbology that is  
3 around there in the navigation mode.

4 Q. As you sit here today, you don't know?

5 COLONEL FLY: I refer to it as the TD  
6 box. There may be a different term for it. I can  
7 assure that there is a HUD symbology around it.

8 Q. But is it active in the navigation mode  
9 is my question?

10 COLONEL FLY: In the navigation mode,  
11 you see get HUD symbology around your selected  
12 steer point if the selected steer point is within  
13 the HUD field of view.

14 JUDGE FARRAR: Wait a minute, Colonel.  
15 While the general rule is counsel can't insist on  
16 a yes or no answer, you're entitled to explain,  
17 I've heard that question several times, and I  
18 haven't heard a yes or no. And remember what I  
19 said, if you don't know -- if your experience goes  
20 back to when you said, you know, you first flew  
21 one of those, and you don't remember, we would  
22 rather you say --

23 COLONEL FLY: Your Honor --

24 JUDGE FARRAR: We would rather you say,  
25 you don't know, you know, maybe that's something

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1 you can find out later and supply, but there's  
2 nothing wrong -- Mr. Soper said, as you sit here  
3 today, you don't know the answer to that, and we'd  
4 much rather, if the answer to that is yes, I don't  
5 know the answer, say that, rather than give an  
6 answer that doesn't acknowledge. But before you  
7 say anything, your counsel wants to say something.

8 MR. GAUKLER: Your Honor, I think  
9 that's quite clear to me that he's referring to  
10 symbology, and the issue is what that symbology is  
11 called, the symbology around the steer point if  
12 it's within the heads-up field of view.

13 JUDGE FARRAR: I mean I don't  
14 understand this as well as Mr. Soper or you or  
15 your witness, but I think I heard a question that  
16 we didn't get a yes or no answer to. Mr. Soper,  
17 ask the question again.

18 Q. (By Mr. Soper) The question is, the TD  
19 box is not active in the navigation mode, true or  
20 false?

21 COLONEL FLY: Your Honor, what I was  
22 trying to say, if I could, please, is I may have  
23 used the wrong terminology. I don't know that  
24 it's the TD box, but I am trying to tell counsel  
25 that there is HUD symbology around the selected

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1       steer point. It may not be called the TD box, but  
2       there is selected symbology. I will check and get  
3       back with you.

4               JUDGE FARRAR: Maybe either you or I is  
5       misunderstanding his question. I thought his  
6       question goes to when the engine shuts down, the  
7       power goes down and you don't -- whatever you call  
8       it, you don't see what you like to see when you're  
9       piloting a plane. Is that your question,  
10      Mr. Soper?

11             MR. SOPER: That was actually a  
12      previous question. I can move forward, Your  
13      Honor.

14             JUDGE FARRAR: No, I don't want you to  
15      move forward, because maybe -- I don't know if my  
16      colleagues share my view, but I detected from the  
17      way you were pursuing this question, that this is  
18      an important issue, and what's important to you,  
19      it's important to us. And I mean -- let me ask a  
20      question, if you don't mind me interrupting.

21             MR. SOPER: Please.

22             JUDGE FARRAR: I'm flying a plane and I  
23      see this heads-up -- I see with my eyes out on the  
24      horizon and I see a screen in front of me that's  
25      showing me something, the engine goes off. Do I

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1 still see that image?

2 COLONEL FLY: The HUD will blink  
3 momentarily as the main generator drops off-line  
4 and the backup generator supplies -- systems come  
5 on-line and repower.

6 JUDGE FARRAR: So I'll lose the image  
7 momentarily and then it will come back up?

8 COLONEL FLY: Yes, Your Honor.

9 Q. (By Mr. Soper) Momentarily is -- give  
10 an estimate of what that means to you?

11 COLONEL FLY: Two, three seconds.

12 Q. You said a half a second before. Are  
13 you just uncertain?

14 COLONEL FLY: It's a very short period  
15 of time. I have never measured it.

16 Q. Let me, if I might back up. I picked  
17 up from the Judge's questions. If I might, just  
18 as to each of you. First, is it General Cole?

19 .GENERAL COLE: That's correct.

20 Q. And how do you prefer to be addressed  
21 in this proceeding, sir?

22 GENERAL COLE: That's fine, just as you  
23 did.

24 Q. And you're retired from the Air Force;  
25 is that right?

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1 GENERAL COLE: That's right.

2 Q. Could you speak in the microphone, sir.

3 GENERAL COLE: That's correct.

4 Q. And when did you retire?

5 GENERAL COLE: I retired in 1994.

6 Q. And where do you live presently?

7 GENERAL COLE: Springfield, Virginia.

8 Q. Is that in the Washington D.C. area?

9 GENERAL COLE: That's correct.

10 Q. And Colonel Fly, if I might ask you.

11 COLONEL FLY: Yes.

12 Q. Good afternoon. How do you prefer to  
13 be addressed here today?

14 COLONEL FLY: That's fine.

15 Q. And you're also retired from the Air  
16 Force; is that right?

17 COLONEL FLY: That's correct.

18 Q. And you retired when?

19 COLONEL FLY: 1998.

20 Q. And is it General Jefferson?

21 GENERAL JEFFERSON: That's correct.

22 Q. And do you prefer to be addressed as  
23 General Jefferson?

24 GENERAL JEFFERSON: Yes, I do.

25 Q. And you're retired, is that right?

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1 GENERAL JEFFERSON: That's correct.

2 Q. And retired from the U.S. Air Force in  
3 what year?

4 GENERAL JEFFERSON: I retired from the  
5 Air Force in 1989.

6 Q. Colonel Jefferson -- or excuse me,  
7 General Jefferson, when did you start assisting  
8 PFS in this matter?

9 GENERAL JEFFERSON: I started assisting  
10 PFS in June of 1999.

11 Q. And Colonel Fly?

12 COLONEL FLY: I answered some questions  
13 that General Jefferson -- they were on before I  
14 was. They called me a few times, I just provided  
15 them answers. It was just as a courtesy. My  
16 first, if you will, official action was in  
17 October, I think of '99.

18 Q. And General Cole?

19 GENERAL COLE: October of 1998.

20 Q. So you were the first hired by PFS; is  
21 that correct?

22 GENERAL COLE: That's correct, of the  
23 three.

24 Q. Now, Colonel Fly -- or excuse me,  
25 General Cole, let me, if I might, address you.

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1 The proposed storage facility is planned to be  
2 located between two operating areas, two military  
3 areas, you're aware of that?

4 COLONEL FLY: That's correct.

5 Q. And you also know that F-16 jet  
6 fighters from Hill Air Force Base fly in these  
7 military operating areas?

8 COLONEL FLY: Yes, they do.

9 Q. And there's thousands of those flights  
10 each year, is there not?

11 COLONEL FLY: The number varies from  
12 year-to-year. In 1998, they were 3,871. I just  
13 gave that as an example.

14 Q. And, for example, what were they in  
15 2000?

16 COLONEL FLY: In 2000, I would have to  
17 check the reference, but I believe they were 5,000  
18 and some, I don't know the precise number.

19 Q. And there's been an increase in the  
20 number of F-16s assigned to Hill since that time,  
21 hasn't there?

22 COLONEL FLY: There has been.

23 Q. And these flights through Skull Valley  
24 are on training missions originating from Hill Air  
25 Force Base; is that your understanding?

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1 COLONEL FLY: That's correct.

2 Q. Some of these F-16s are carrying bombs;  
3 is that right?

4 COLONEL FLY: Some are.

5 Q. In fact, in 1998, there was 111 flights  
6 carrying 2000-pound live bombs; isn't that right?

7 COLONEL FLY: I would have to check the  
8 reference. That sounds right. There were 15  
9 percent of the total sorties carrying ordinance  
10 that year.

11 MR. SOPER: May I approach and have  
12 this marked, Your Honor?

13 JUDGE FARRAR: Uh-huh. We are at State  
14 what?

15 MR. SOPER: Excuse me just one minute,  
16 Your Honor.

17 JUDGE FARRAR: As long as we have a  
18 natural break here, our replacement court reporter  
19 has come in, so why don't we take -- if it won't  
20 interrupt the train of where you're going.

21 MR. SOPER: Not at all.

22 JUDGE FARRAR: We're about halfway  
23 through, let's take a ten-minute break. I've got  
24 14 of, let's be back at five of, with a new  
25 reporter, and thank you, Ms. Reporter.

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1 (STATE'S EXHIBIT-144 WAS MARKED.)

2 JUDGE FARRAR: We are back on the  
3 record. We have our replacement court reporter  
4 here. Mr. Soper, I think you had the exhibits  
5 marked during the break.

6 MR. SOPER: We did, your Honor.

7 MS. MARCO: I didn't receive copies.

8 JUDGE FARRAR: Go ahead, Mr. Gaukler,  
9 while he's doing that.

10 MR. GAUKLER: I just wanted to say that  
11 at the break we gave the court reporter three  
12 copies of Mr. Vigeant's testimony.

13 JUDGE FARRAR: The former court  
14 reporter.

15 JUDGE LAM: Mr. Gaukler, do we have the  
16 copy of that?

17 MR. GAUKLER: It's the same as the  
18 prefiled testimony. But yes, we have copies.

19 JUDGE KLINE: I need one.

20 JUDGE FARRAR: Since we took a break,  
21 you marked this as an exhibit.

22 MR. SOPER: This is State's Exhibit  
23 144.

24 May I proceed, your Honor?

25 JUDGE FARRAR: Yes.

1 Q. (By Mr. Soper) General Cole, you have  
2 before you what's been marked as State's Exhibit  
3 144. Can you identify that for us, please?

4 GENERAL COLE: Yes, it appears to be an  
5 F-16 but it is not a U.S. one. It has a foreign  
6 tail flash on it.

7 Q. Someone else made that comment. This  
8 is off the United States Air Force, I thought  
9 official web site. So it's whatever they furnish.  
10 Is it in any significant way different than the  
11 type of aircraft stationed at Hill Air Force Base?

12 GENERAL COLE: It depends on what block  
13 it is. I can't tell. There's no color on the  
14 roundel of whose it is. Perhaps Netherlands,  
15 Belgium. And I can't tell which block number it  
16 is.

17 JUDGE FARRAR: I don't know what a  
18 block number is.

19 GENERAL COLE: It's a different  
20 modification, your Honor, from -- they make  
21 improved versions so we have block 30s, block 40s,  
22 block 50s.

23 Q. This is an F-16, though? You do  
24 recognize that?

25 GENERAL COLE: Yes.

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1 Q. And it is either the same or similar to  
2 aircraft flown at Hill Air Force Base?

3 GENERAL COLE: Yes.

4 Q. And it's a single-engine fighter?

5 GENERAL COLE: That's correct.

6 Q. A crew of one?

7 GENERAL COLE: Unless it's a D model,  
8 yes, sir.

9 Q. And they are not very common, are they?

10 GENERAL COLE: I don't know the  
11 percentage but they are not, really. We carry  
12 two.

13 Q. And how fast does this aircraft fly?

14 GENERAL COLE: I'm going to tell you  
15 I'm not certain. Approximately mach 1.6, I  
16 believe. But I would have to check that.

17 Q. Does mach 2 sound right?

18 COLONEL FLY: Your Honor, may I offer  
19 mach 2 testimony?

20 Q. Well, actually, this is just what we  
21 talked about. When this witness finishes --

22 GENERAL COLE: I'm saying I'm not  
23 certain and I don't know. I would have said mach  
24 1.6.

25 Q. And the wing span would have been --

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1 JUDGE FARRAR: This is a good example  
2 of trying to put our rule in practice. If the one  
3 witness doesn't know, I don't want to interfere  
4 with the strategy of your case --

5 MR. SOPER: How about this, your Honor:  
6 If the witness answers, "I don't know," it's  
7 appropriate for the other witness to answer. If  
8 he has an answer, I would just as soon hear the  
9 answer. If he says, "I don't know," then --

10 MR. GAUKLER: I think your Honor said  
11 if another witness has something to add, that is  
12 appropriate. And I think while we are on the  
13 topic we ought to have the information all in the  
14 record at the same time.

15 JUDGE FARRAR: That's one purpose I'd  
16 like to serve. But there may be another purpose  
17 Mr. Soper is getting at here, and I don't want to  
18 interfere with that. Hold on a minute.

19 (Discussion off the record.)

20 JUDGE FARRAR: Notwithstanding what we  
21 said twenty minutes ago, or thirty minutes ago,  
22 there will be times in the trial, and this may be  
23 one of them, where we will let Counsel pursue a  
24 line of questions of one witness and we will find  
25 a way to follow those up later to get information

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1 that that witness may not know but that we think  
2 is important for the record.

3 MR. GAUKLER: Your Honor, if I could  
4 suggest, this was a group effort and so they would  
5 rely upon the expertise of each other in terms of  
6 the work that they did. And what Mr. Soaper is  
7 trying to do is create a dichotomy that didn't  
8 exist in their actual work. I mean, if General  
9 Cole had a question or was uncertain about what  
10 the speed of the F-16 was, he would turn to  
11 Colonel Fly and say, "What is it?"

12 JUDGE FARRAR: That's a good point, Mr.  
13 Gaukler. But eventually what I'm saying is there  
14 may be times where we will separate the answer to  
15 Counsel's question from what we later learn.  
16 There's two values being served here, and in some  
17 instances one will be paramount and in other  
18 instances the other will be. And I don't like the  
19 notion of waiting to redirect.

20 MR. SOPER: I will try to ask the  
21 questions, if the witness doesn't know, of another  
22 panel member.

23 JUDGE FARRAR: Where that doesn't  
24 interfere with your strategy, we would appreciate  
25 you -- in other words, we don't know where you are

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1 going. A seemingly innocuous question may be only  
2 the first of an important series. A seemingly  
3 important question may prove not to be important.  
4 We don't want to interfere with whatever you are  
5 trying to accomplish. Where it does not interfere  
6 with that purpose, then we would appreciate it, if  
7 not getting the answer from one witness, you get  
8 it from the other.

9 MR. SOPER: Very well, your Honor. May  
10 I proceed?

11 JUDGE FARRAR: Yes.

12 MR. SOPER: Thank you.

13 Q. (By Mr. Soper) General Cole, I take it  
14 you are not certain what the speed of the F-16 is.  
15 Is that right?

16 GENERAL COLE: I'm not certain. My  
17 estimate was 1.6 mach.

18 Q. And Colonel Fly, do you have another  
19 answer?

20 COLONEL FLY: Yes. If I could expand  
21 on what General Cole said. From a practical  
22 perspective in terms of operational flying, which  
23 is the type of flying typically done at Hill Air  
24 Force Base, most pilots will seldom see a speed  
25 above 1.6, maybe 1.7 mach. The advertised top

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1 speed in terms of mach number for the F-16 is mach  
2 2.

3 Q. Thank you. And General Cole, do you  
4 know the wing span of the F-16?

5 GENERAL COLE: I believe it is 30 feet.

6 Q. Colonel Fly, what is it?

7 COLONEL FLY: 33 feet, if you include  
8 the Aim-9 missile rails on the wing tips.

9 Q. And Colonel Fly, it is considered a  
10 high performance aircraft; is that right?

11 COLONEL FLY: Yes, I would agree with  
12 that.

13 Q. And General Cole, do you know what the  
14 ceiling for the aircraft is?

15 GENERAL COLE: I do not. It would be  
16 approximately 55,000 feet at the top.

17 Q. Colonel Fly?

18 COLONEL FLY: The operational service  
19 ceiling is 50,000, unless it is specially  
20 equipped.

21 Q. General Cole, let me ask you, sir, you  
22 have made an evaluation of the risk posed by F-16  
23 jet fighters and bombs crashing into the PFS site;  
24 is that right?

25 GENERAL COLE: That is right. May I

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1 give you a little more information on that?

2 Q. No. I just want to know if you have  
3 made an evaluation.

4 GENERAL COLE: I have made an  
5 evaluation.

6 Q. And it is your opinion, sir, that  
7 crashes from F-16s and military bombs do not pose  
8 a significant hazard to the planned nuclear waste  
9 facility; is that right?

10 GENERAL COLE: That's correct.

11 Q. And of course the hazard you are  
12 concerned with here is the release of  
13 radioactivity? Is that --

14 GENERAL COLE: The hazard I'm concerned  
15 with is crash impact.

16 Q. Okay. And the analysis you performed  
17 concludes that there's no significant risk, as  
18 described in Exhibit N and Exhibit O that have  
19 been introduced already. Is that correct?

20 GENERAL COLE: That's correct.

21 Q. I will refer to N as the crash report  
22 and to O as the addendum to the crash report. Is  
23 that fair? Would you understand my reference?

24 GENERAL COLE: That would be fine.

25 Q. Could I ask what you are reading,

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1 General?

2 GENERAL COLE: I was trying to find  
3 which tab I had the information in there.

4 JUDGE FARRAR: While Counsel is doing  
5 housekeeping, what is mach at 5000 feet?

6 COLONEL FLY: Sir, mach is the speed of  
7 sound. It is a function of temperature.

8 JUDGE FARRAR: And I want to say is it  
9 660?

10 COLONEL FLY: No. It's a little --  
11 typically speed per mach is around 1000 to 1100  
12 feet per second. I will have to do math to get  
13 you a number on that. It's somewhere in the  
14 vicinity of 700 miles an hour.

15 Q. General Cole, I have handed you a page  
16 from the crash report, Page 6. And towards the  
17 bottom in bold print it says NUREG 0800  
18 Methodology, and it shows the NUREG formula for  
19 calculating air crash probability is as follows,  
20 and then the formula follows. Do you see my  
21 reference?

22 GENERAL COLE: I see that.

23 Q. And you are familiar with the NUREG  
24 0800 formula that is shown there?

25 GENERAL COLE: I am familiar with it.

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1 Q. And you are aware that NUREG 0800 is a  
2 publication of the NRC?

3 GENERAL COLE: That's correct.

4 Q. And that it contains the methodology  
5 for determining crash probabilities specifically  
6 for nuclear facilities?

7 GENERAL COLE: That's right.

8 Q. And have you read it as it pertains to  
9 aircraft crash probability?

10 GENERAL COLE: I have.

11 Q. In determining the probability of a  
12 crash, you needed to know a lot of information.  
13 You needed to know how many F-16 missions are  
14 flown through Skull Valley; is that right?

15 GENERAL COLE: That's correct.

16 Q. And the type of flight training  
17 missions that originate from Hill Air Force Base?

18 GENERAL COLE: Well, I'm not sure I  
19 would need to know that. I would need to know the  
20 number of aircraft that go through Skull Valley.

21 Q. Would you need to know whether you did  
22 night goggle training, for example?

23 GENERAL COLE: Not for using this  
24 formula, I wouldn't.

25 Q. Well, for picking the numbers for it?

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1 I understand the formula just requires high school  
2 math but it requires a selection of certain values  
3 to make the formula operate; is that right?

4 GENERAL COLE: I would use simply the  
5 aircraft numbers.

6 Q. So it's your testimony that knowledge  
7 of the training missions at Hill Air Force Base is  
8 not important to the formula?

9 GENERAL COLE: No, that is not correct.  
10 Knowledge of the training missions at Hill Air  
11 Force Base is important in an order of magnitude  
12 sense to scope the risk and understand what the  
13 airplanes are doing.

14 Q. For instance, on the Moser Recovery  
15 Route, are the training missions irrelevant to  
16 that?

17 GENERAL COLE: Well, the Moser Recovery  
18 Route is basically a way to get back to Hill Air  
19 Force Base from the range. It's used normally in  
20 adverse weather, night conditions for northern  
21 recoveries.

22 Q. My question was, sir, is it relevant to  
23 know the missions such as night vision goggle  
24 training relevant to determining a number for the  
25 Moser Recovery Route?

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1                   GENERAL COLE: It would be if it proves  
2 an increase in the use of the Moser Recovery  
3 Route. If they use it, if they are flying night  
4 vision goggles.

5           Q.       You agree you would have to know  
6 something about the percentage of flights that  
7 carry bombs?

8                   GENERAL COLE: That's correct.

9           Q.       And you'd have to know something about  
10 operation terrain masking, for example?

11                   GENERAL COLE: That's correct.

12           Q.       You'd have to know the flight path from  
13 Hill to the UTTR?

14                   GENERAL COLE: That's correct.

15           Q.       And you'd need to know the flight path  
16 returning to Hill from the UTTR?

17                   GENERAL COLE: That's correct.

18           Q.       And you'd have to know how many  
19 missions are flown at night?

20                   GENERAL COLE: That would be helpful.

21           Q.       Okay. And you'd have to know the  
22 altitude of flights in Skull Valley?

23                   GENERAL COLE: That's correct.

24           Q.       And you'd have to be familiar with the  
25 Skull Valley terrain such as the mountains?

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1 GENERAL COLE: That's correct.

2 Q. And where the restricted air space  
3 begins?

4 GENERAL COLE: That's right.

5 Q. And the type of formations flown by  
6 F-16 pilots?

7 GENERAL COLE: That's correct.

8 Q. And the weather in Skull Valley?

9 GENERAL COLE: That's correct.

10 Q. And the crash rates that are published  
11 for F-16s?

12 GENERAL COLE: That's correct.

13 Q. In considering the probability of an  
14 F-16 crash, except if the pilot is unconscious,  
15 the pilot would be expected to eject before the  
16 F-16 crashes, I take it?

17 GENERAL COLE: Yes.

18 Q. Is it your opinion that in most cases  
19 if a pilot is forced to eject from an F-16 in  
20 Skull Valley, that the pilot would first, before  
21 ejecting, locate the nuclear waste facility  
22 proposed by PFS, steer away from that facility, if  
23 necessary, and then the pilot would eject?

24 GENERAL COLE: The pilot would have  
25 positional and situational awareness of what it is

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1 before he ejects. He would not necessarily look  
2 at it and find it.

3 Q. Let me ask one question to clear this  
4 up. I take it you have never flown an F-16, sir;  
5 is that right?

6 GENERAL COLE: I have flown the  
7 simulator, and I have had ejection seat training.  
8 I have not flown an F-16.

9 Q. Colonel Fly, let me address this to  
10 you. I think we need to clear up something about  
11 a heads-up display so there's no misunderstanding  
12 from our last questions.

13 A heads-up display -- let's say that  
14 you are flying through Skull Valley and you have  
15 not programmed the heads-up display with PFS site  
16 as a turn point. Make that assumption. You are  
17 flying through Skull Valley. The heads-up site  
18 does not show ranch houses, lakes, PFS site,  
19 cities, or anything else that might be on the  
20 ground, if it's not properly programmed in as a  
21 turn site. Isn't that correct?

22 COLONEL FLY: That's correct. And to  
23 expand on that just a little bit, that doesn't  
24 mean you won't be able to see those things through  
25 the heads-up display. The heads-up display is a



1 piece of glass that you look through that has  
2 green imagery or symbology, is the phrase,  
3 projected onto it.

4 Q. So to the extent it is a piece of glass  
5 and you can see through it, you still might be  
6 able to see the PFS site?

7 COLONEL FLY: Yes. You conduct normal  
8 flight looking through the heads-up display.  
9 That's how you take off and land and do  
10 everything.

11 Q. I understand that. The heads-up  
12 display in the case I described would do nothing  
13 to facilitate the location of the PFS site, would  
14 it?

15 COLONEL FLY: In the situation you  
16 described, that's correct.

17 Q. General Cole, the evaluation of the  
18 probability of impacts, in connection with that,  
19 it's your opinion that in most cases approximately  
20 85 percent of the crashes -- let me rephrase that.  
21 Excuse me.

22 It is your opinion, is it not, that in  
23 approximately 85 percent of F-16 crashes that  
24 might occur in Skull Valley, that the pilot would  
25 be able to know where the PFS site is and steer

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1 away from it. Is that your testimony?

2 GENERAL COLE: That's correct. And  
3 that's a product of 95 percent of 90.

4 Q. I understand. In order to make that  
5 opinion, you needed to know some additional  
6 information such as the type of emergency that  
7 causes the pilot to eject?

8 GENERAL COLE: That's correct.

9 Q. For example, in some cases the plane  
10 will just be out of control; isn't that right?

11 GENERAL COLE: That is one example.  
12 There are others.

13 Q. And you would have to understand the  
14 ejection processes, how much time it takes?

15 GENERAL COLE: You would.

16 Q. And you would have understand the  
17 dangers to the pilot from ejecting at, say, too  
18 high an altitude or too low an altitude?

19 GENERAL COLE: That's correct.

20 Q. And you would have to know the dangers  
21 to a pilot from ejecting at too high a speed?

22 GENERAL COLE: That's correct.

23 Q. You'd have to understand something  
24 about the pilot's stress level?

25 GENERAL COLE: True.

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1 Q. The pilot, in an ejection situation, is  
2 contemplating a very violent departure from the  
3 aircraft, wouldn't you say?

4 GENERAL COLE: That's correct.

5 Q. And the aircraft may be travelling 300  
6 miles per hour or faster at the time?

7 GENERAL COLE: That's true.

8 Q. The process of ejection involves  
9 actually being shot out of the aircraft with  
10 rockets; isn't that right?

11 GENERAL COLE: That's right.

12 Q. And those rockets would exert an  
13 extremely high g-force on the pilot?

14 GENERAL COLE: That's true.

15 Q. And you understand, do you not, that  
16 there are possibilities of severe injury just from  
17 the ejection process?

18 GENERAL COLE: There are possibilities.

19 Q. And of course the pilot might  
20 contemplate or be intrepid about what is about to  
21 come, thinking about ejection?

22 GENERAL COLE: This -- Air Force pilots  
23 are well trained and conditioned to cope with  
24 in-flight stress and duress. Ejection is only one  
25 of many circumstances that would be like that.

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1 Certainly there would be some trepidation, but  
2 it's nothing they can't deal with.

3 Q. And you would have to know how the  
4 pilot's performance is affected by this sort of  
5 in-flight emergency?

6 GENERAL COLE: That's correct. It's a  
7 human factors issue.

8 Q. And it is an in-flight emergency, is it  
9 not?

10 GENERAL COLE: It certainly is, if you  
11 are ejecting.

12 Q. Let me ask you, sir, about some of your  
13 background with respect to these issues. You were  
14 the first of this panel to be hired by PFS?

15 GENERAL COLE: That's correct.

16 Q. And you worked on this case or this  
17 matter for approximately eight months before being  
18 joined by Colonel Jefferson?

19 GENERAL COLE: Seven or eight, that's  
20 right.

21 Q. And you worked on it for over a year  
22 before Colonel Fly was hired; is that right?

23 GENERAL COLE: Not quite a year. I  
24 started in late October and I believe he joined us  
25 in October or September. I'm not certain exactly

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1 the date.

2 Q. Okay. And you, yourself, have degrees  
3 in history and business, I understand?

4 GENERAL COLE: And a bachelor's in  
5 engineering.

6 Q. And you were an assistant professor of  
7 history at the Air Force Academy from 1970 to  
8 1974, I understand?

9 GENERAL COLE: That's correct.

10 Q. And you retired from the Air Force in  
11 1994 after, I believe, 30 years of service. Is  
12 that correct?

13 GENERAL COLE: That's right.

14 Q. And for the last five of those years,  
15 you served as a Brigadier General?

16 GENERAL COLE: In the Air Force, that's  
17 correct. Actually the last four, from 1990 to  
18 '94.

19 Q. Is that still known as a one-star  
20 general?

21 GENERAL COLE: That's correct.

22 Q. I understand that there are general  
23 officers from many different disciplines. There  
24 are generals that might be engineers, for example.

25 GENERAL COLE: That's true.

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1 Q. Maybe chaplains?

2 GENERAL COLE: That's very specialized,  
3 but that's correct.

4 Q. Maybe pilots?

5 GENERAL COLE: A pilot is more of a  
6 general skill field, true.

7 Q. And there are various rank levels of  
8 generals, as I understand it. There's the  
9 brigadier general. That's your position; is that  
10 right?

11 GENERAL COLE: That's right. Retired,  
12 yes.

13 Q. Also known as a one-star general?

14 GENERAL COLE: That's right.

15 Q. And a major general. That would be a  
16 two-star general?

17 GENERAL COLE: Two star. That's  
18 correct.

19 Q. And that would be General Jefferson?

20 GENERAL COLE: That would be General  
21 Jefferson.

22 Q. And there are three-star generals?

23 GENERAL COLE: Not too many. Those are  
24 Lieutenant Generals.

25 Q. And there are four-star generals?

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1                   GENERAL COLE: Even fewer. And they  
2 are generals, yes.

3           Q.       And I guess in times of war there are  
4 five-star generals?

5                   GENERAL COLE: No, not very often.  
6 There's only been five in history. Not one for a  
7 long time.

8           Q.       I see. Well, there are hundreds at any  
9 given time. Hundreds of generals in the Air  
10 Force, are there not?

11                   GENERAL COLE: Not that many. About  
12 300.

13           Q.       And those are mostly Brigadier  
14 Generals, I take it?

15                   GENERAL COLE: About half.

16           Q.       And as far as retired generals, there  
17 are literally thousands of retired generals from  
18 the Air Force, are there not?

19                   GENERAL COLE: It depends on how long  
20 you live.

21           Q.       That's fair enough. There are, sir,  
22 many retired generals doing what you are doing  
23 right now, are there not; and that is testifying  
24 for a fee?

25                   GENERAL COLE: A significant number, I

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1 would say so.

2 Q. In fact, PFS hired you through an  
3 agency called, is it Burdshaw or Burdeshaw?

4 GENERAL COLE: Burdeshaw Associates.

5 Q. Burdeshaw Associates. And that's an  
6 agency in the Washington, D.C. area?

7 GENERAL COLE: That's right.

8 Q. And when you work there, you are known  
9 as an associate? Is that right?

10 GENERAL COLE: That's true.

11 Q. And that agency provides businesses  
12 with retired military officers to assist  
13 businesses for a fee?

14 GENERAL COLE: They actually are an  
15 association of senior military and government  
16 officials that provide services and advice,  
17 proposal preparation across the board to industry;  
18 clients such as Boeing, Dyncorp, Lockheed Martin.  
19 Whoever needs that type of expertise and  
20 assistance.

21 Q. I believe that's what I was getting at.  
22 And they are mainly retired generals?

23 GENERAL COLE: Mainly, that's correct.

24 Q. And General Jefferson was also hired  
25 through the Burdeshaw agency; is that right?

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1                   GENERAL COLE: That's correct. We are  
2 both Burdeshaw associates. All three of us are  
3 Burdeshaw associates.

4           Q.       That would be Colonel Fly, as well?

5                   GENERAL COLE: That's correct.

6           Q.       Do you get paid directly from PFS or  
7 does Burdeshaw pay you or how does that work?

8                   GENERAL COLE: I'm reimbursed by  
9 Burdeshaw for the professional opinions I provide  
10 to Shaw Pitman and PFS.

11          Q.       I see. And how much have you been paid  
12 to date for work on this PFS matter?

13                   MR. SILBERG: I would object to that as  
14 irrelevant to this hearing, Mr. Chairman.

15                   MR. SOPER: I have, in my experience,  
16 not seen a more relevant or common  
17 cross-examination question that's uniformly been  
18 considered appropriate.

19                   MR. SILBERG: Not in NRC proceedings.

20                   MR. SOPER: Well, you got me there.

21                   JUDGE FARRAR: When I was in law school  
22 I knew the answer to that question. I don't know  
23 the answer anymore. But if we are going to go by  
24 what NRC proceedings go, I have a couple of good  
25 consultants up here.

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1 (Discussion off the record.)

2 JUDGE FARRAR: I forgot I also had with  
3 us someone who was in law school somewhat more  
4 recently than I was, and a couple of people who  
5 have been through this, which comports with my  
6 instinct that there's nothing wrong with this  
7 question.

8 MR. SOPER: Thank you, your Honor. Did  
9 you understand the question General Cole?

10 GENERAL COLE: I did. And the billing  
11 rates for Burdeshaw are \$650 a day for an  
12 associate and \$800 a day for a team lead. And  
13 that was the rate during the time period that we  
14 were working on it.

15 Q. (By Mr. Soper) Aren't you still  
16 working for Burdeshaw?

17 GENERAL COLE: That's correct.

18 Q. And how much are you making an hour  
19 right now?

20 GENERAL COLE: They have just upped it  
21 effective 1 April.

22 Q. And how much are you making an hour?

23 GENERAL COLE: Not an hour. Per day.

24 Q. And that would be how much now?

25 GENERAL COLE: That would be \$1000 per

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1 day.

2 Q. That's a flat rate, \$1000 a day? It's  
3 not broken down hourly or anything?

4 GENERAL COLE: It is broken down into  
5 quarter man days. But also I think you realize  
6 that we don't do this full-time. It is when we  
7 are working and they turn the clock on.

8 Q. I see. What is the hourly rate?

9 GENERAL COLE: Well, it was \$100 an  
10 hour for an eight-hour day, so it's gone up a bit.  
11 It's \$125 an hour if I can do the math quickly,  
12 for me.

13 Q. Who was your primary contact person at  
14 PFS that gives you assignments?

15 GENERAL COLE: At PFS?

16 Q. Yes.

17 GENERAL COLE: Jay Silberg and Paul  
18 Gaukler and Sean Barnett. They work for Shaw  
19 Pitman but they are my contacts.

20 Q. Have you met with any PFS employees?

21 GENERAL COLE: I met with John Donnell.

22 Q. Who is John Donnell?

23 GENERAL COLE: He is the project  
24 manager.

25 Q. But primarily you work with PFS's

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1 lawyers?

2 GENERAL COLE: That's correct.

3 Q. Were they involved in retaining you, as  
4 well?

5 GENERAL COLE: Well, the way it worked  
6 was they went to Burdeshaw, Burdeshaw offered me,  
7 and they told Burdeshaw that they would like to  
8 retain me.

9 Q. I see. You have another full-time job,  
10 I take it, besides this?

11 GENERAL COLE: That's correct. I do.

12 Q. So this is part-time work, so to speak?

13 GENERAL COLE: That's true.

14 Q. Let me ask you, starting back with your  
15 Air Force career, your last duty in the Air Force  
16 was chief of safety, I understand?

17 GENERAL COLE: That's correct.

18 Q. And that's a job I think you said you  
19 had for around three years?

20 GENERAL COLE: Four.

21 Q. Four years.

22 GENERAL COLE: Excuse me. I'll correct  
23 that. It was three.

24 Q. Three years. And as chief of safety  
25 you dealt with a very broad spectrum of safety

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1 matters that were generally of interest to the Air  
2 Force; is that true?

3 GENERAL COLE: That's true. I was  
4 directly responsible for accident prevention and  
5 accident investigation for 500,000 personnel and  
6 9000 airplanes.

7 Q. And that would also include, besides  
8 air safety, ground safety?

9 GENERAL COLE: Yes, sir. Ground safety  
10 and also surety of safety and security for Air  
11 Force's nuclear weapons.

12 Q. And maintenance issues?

13 GENERAL COLE: In a safety respect,  
14 yes. Ground safety, ramp safety.

15 Q. And Air Force housing?

16 GENERAL COLE: Only if those people  
17 that work for me to make sure they were being  
18 taken care of.

19 Q. And even playgrounds on the Air Force;  
20 isn't that right?

21 GENERAL COLE: Well, in a safety  
22 respect, when I was chief of safety, that's  
23 correct. Normally a base commander or an  
24 installation commander or a wing commander is  
25 directly responsible for his or her facility.

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1           Q.       I saw a notice from the chief of safety  
2 on an animal swing for a playground. Would that  
3 not be outside the scope of what you did?

4           GENERAL COLE: Well, whoever is chief  
5 of safety at that time, you know, makes the value  
6 judgments. And I would consider it a safety issue  
7 for the children, the dependents. And if it was  
8 on an Air Force base it would not be outside the  
9 pale of authority and responsibility.

10          Q.       In that job of chief of safety, you did  
11 not analyze the risk from F-16 crashes on the  
12 UTTR, did you?

13          GENERAL COLE: No, not directly. Not  
14 on the UTTR.

15          Q.       And you were not called upon to  
16 evaluate the risks of F-16s crashing into any  
17 training range, were you?

18          GENERAL COLE: I was called upon to  
19 address, assess, and deal with F-16 issues during  
20 those three years. And that included crashes,  
21 emergencies, engine failures.

22          Q.       Did you do a crash impact for any  
23 safety range, any test and training range?

24          GENERAL COLE: I did not do a crash  
25 impact study, no.

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1 Q. Okay. In fact, you haven't done a  
2 crash impact study for any particular site before,  
3 have you?

4 GENERAL COLE: No. This is the first  
5 one.

6 Q. And as chief of safety, your duties  
7 didn't involve a study of whether F-16 pilots  
8 might be able to avoid impact with a particular  
9 ground site before ejecting?

10 GENERAL COLE: They most certainly did.  
11 I was concerned with the whole spectrum of human  
12 factors in accident prevention. And I dealt  
13 intensely with pilots, their training, their  
14 proficiency, how they flew, incidents, accidents.  
15 I was personally responsible for reviewing and  
16 approving every accident report the Air Force had  
17 in that three-year period.

18 Q. So in answer to the question, you did  
19 do a study of whether F-16 pilots might be able to  
20 avoid a ground site?

21 GENERAL COLE: I said I dealt with F-16  
22 crash risk emergency procedures and human factors  
23 issues. I did not say I did a study.

24 Q. So you did not do a study?

25 GENERAL COLE: I did not do a study.

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1 Q. And you didn't have any occasion to use  
2 the NUREG 0800 method, did you?

3 GENERAL COLE: Not when I was chief of  
4 safety. I was familiar with it but I didn't use  
5 it in that position.

6 Q. And you didn't have occasion to  
7 evaluate the risk of any nuclear waste sites, I  
8 take it, during that job?

9 GENERAL COLE: No. Nuclear weapons and  
10 their transportation and safety, security  
11 guarding, yes. But not nuclear waste sites.

12 Q. During your Air Force career did you  
13 serve as a commander at Hill Air Force Base at  
14 all?

15 GENERAL COLE: I did not.

16 Q. Were you ever stationed at Hill in any  
17 capacity?

18 GENERAL COLE: No.

19 Q. And I take it you have never piloted an  
20 F-16 through Skull Valley?

21 GENERAL COLE: No. I have flown the  
22 simulator, but I haven't flown the airplane.

23 Q. Have you piloted any aircraft through  
24 Skull Valley?

25 GENERAL COLE: Not through Skull

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1 Valley, no.

2 Q. Have you ever flown through Skull  
3 Valley as a passenger?

4 GENERAL COLE: I came close. I dropped  
5 a bunch of special forces troops at a drop zone I  
6 think near Camp Williams when I was flying special  
7 operations in 141s. I can't remember how close I  
8 came to Skull Valley.

9 Q. You have no recollection of that?

10 GENERAL COLE: I have no recollection  
11 of that. But it was tricky to fly in that area.  
12 I recall that.

13 Q. Have you ever flown through any portion  
14 of the UTTR as a pilot or passenger?

15 GENERAL COLE: No. I have flown on  
16 other ranges, but not that one.

17 Q. I take it, then, you have not ejected  
18 from an F-16 yourself?

19 GENERAL COLE: No. But I have been  
20 through jump master school and got night jumps  
21 with weapons and heavy equipment.

22 Q. Have you ever ejected from any  
23 aircraft?

24 GENERAL COLE: No.

25 Q. And I believe I asked you, you had

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1 never piloted an F-16; is that right?

2 A. I have not. Only the simulator.

3 Q. Have you ever flown in an F-16 as a  
4 passenger?

5 GENERAL COLE: I have not.

6 Q. I understand you did pilot an AC-47 in  
7 Vietnam; is that right?

8 GENERAL COLE: That's correct.

9 Q. And you have logged a thousand hours of  
10 combat time in the AC-47?

11 GENERAL COLE: That's right.

12 Q. And you logged some hours in the AC-47  
13 before Vietnam, I take it?

14 GENERAL COLE: During checkout, when I  
15 was an instructor pilot in the First Air Commando  
16 Wing when I came back, first special operations  
17 wing when I came back from Vietnam.

18 Q. How many total hours do you have in the  
19 AC-47?

20 GENERAL COLE: 1075. I got the other  
21 hours for a second tour back there. That added  
22 more combat time.

23 Q. Now, can you describe an AC-47 for us?

24 GENERAL COLE: If it would be helpful,  
25 I would. It's a DC-3, an older aircraft,

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1 reciprocating engines. It was mounted at the time  
2 with three 7.62 mini guns. It's the antecedent of  
3 the AC-130 Specter that you see on TV now. It was  
4 basically a night operation, limited instrument  
5 capability. You achieved ground contact. You did  
6 night close air support for special forces; Green  
7 Berets, U.S. Army units, Vietnamese units, U.S.  
8 Marines. Whenever they were under attack you  
9 provided illumination with illumination flares and  
10 fire support with your gun.

11 Q. And again, how many hours do you have  
12 in the aircraft?

13 GENERAL COLE: About a thousand; 1075,  
14 I think.

15 MR. SOPER: May I approach, your Honor,  
16 and have this marked?

17 (STATE'S EXHIBIT-145 WAS MARKED.)

18 JUDGE FARRAR: While he's marking that,  
19 let me ask about hours. If I was a young F-16  
20 pilot at Hill for two years, how many hours would  
21 I put in in training in an aircraft?

22 GENERAL COLE: Per month?

23 JUDGE FARRAR: Per month.

24 GENERAL COLE: Depending on the sortie  
25 rate and cycles, I would say approximately twenty.

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1 But if I can get a better number from Colonel Fly,  
2 I'd like to.

3 COLONEL FLY: Judge, I would agree  
4 that's a pretty good guess. They work out to 200,  
5 250 hours a year. Something like that.

6 MR. SOPER: Your Honor, I offered, I  
7 believe, unless I'm mistaken -- I'm offering 144,  
8 the F-16, into evidence. I frankly can't remember  
9 if I said that before.

10 JUDGE FARRAR: You didn't say it. This  
11 is identified as 145. Counsel has it.

12 MR. SOPER: The prior exhibit was 144,  
13 the F-16. And I believe I didn't move it into  
14 evidence. Just a housekeeping to do that now.

15 JUDGE FARRAR: Any objection to that?  
16 To the previous --

17 MR. GAUKLER: No objection.

18 JUDGE FARRAR: That would be admitted  
19 and now we've got 145. You have identified  
20 something as 145.

21 MR. SOPER: 145, I have showed that to  
22 the witness.

23 Q. (By Mr. Soper) Colonel Cole -- excuse  
24 me. General Cole, I apologize, sir. Is this a  
25 picture of the AC-47 or kind of a good likeness

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1       thereof?

2                   GENERAL COLE:   Sure is.   Fond memories.  
3       Brings back some good memories, I hope.

4           Q.       This aircraft, sir, appears to be  
5       fairly dissimilar to the F-16.

6                   GENERAL COLE:   That's very accurate.  
7       Yes, sir.

8           Q.       And would it be fair to say -- you've  
9       piloted some other aircraft in the Air Force, have  
10      you not?

11                   GENERAL COLE:   That's true.

12          Q.       Would it be fair to say that, except  
13      for the AC-47, the other aircraft would be cargo  
14      planes?

15                   GENERAL COLE:   Generally speaking, yes.

16          Q.       But you did pilot a T-41?

17                   GENERAL COLE:   Right.   I was an  
18      instructor in a T-41.   I have also been an  
19      aircraft commander in a T-39, which is a small  
20      executive jet,   a little bigger than an F-86  
21      fighter.

22          Q.       The T-41, what is that?

23                   GENERAL COLE:   Basically a Cessna 172  
24      with a larger engine.

25          Q.       And did you ever pilot a fighter

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1 aircraft of any type?

2 GENERAL COLE: The T-39 was actually a  
3 fighter derivative of the F-86. Fighters per se,  
4 no. Basic Air Force pilot training is fighter type  
5 training, or it was when I went through it, but I  
6 didn't go into fighters.

7 Q. And when did you last pilot a military  
8 aircraft?

9 GENERAL COLE: May of 1994. I was  
10 checked out in a C-21, which was a Lear 35  
11 equivalent which the Air Force has for pilot  
12 proficiency and transporting people.

13 Q. And your resume says --

14 MR. SOPER: I would move the admission  
15 of Exhibit 145, your Honor.

16 JUDGE FARRAR: Any objection?

17 MR. GAUKLER: No objection.

18 JUDGE FARRAR: It will be admitted. We  
19 just admitted it, and it has been marked.

20 MR. SOPER: Thank you, your Honor.

21 Q. (By Mr. Soper) General Cole, your  
22 resume says commercial pilot, without any  
23 explanation. Does that mean you are presently a  
24 commercial pilot?

25 GENERAL COLE: I am not. I have a

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1 commercial pilot certificate, and I also am a  
2 certificated flight instructor in the civilian  
3 world. I'm not doing it actively right now, but I  
4 used to teach flying.

5 Q. That doesn't mean you flew for an  
6 airline, does it?

7 GENERAL COLE: No. I haven't flown for  
8 an airline.

9 Q. After you retired from the Air Force,  
10 sir, your resume says you were the president and  
11 CEO of National Aeronautic Association. Is that  
12 right?

13 GENERAL COLE: That's correct.

14 Q. Also known as the NAA?

15 GENERAL COLE: Yes.

16 Q. And you served in that capacity for two  
17 years?

18 GENERAL COLE: That's true.

19 Q. The NAA is a nonprofit organization  
20 that promotes sport aviation? Is that right?

21 GENERAL COLE: It does that, and also  
22 it sanctions and certifies all aviation and space  
23 records and publishes the book on aviation records  
24 every year. And awards major aviation trophies.

25 Q. And those mostly involve hobbyists, I

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1 take it?

2 GENERAL COLE: No, sir, not really. I  
3 certified a lot of speed records for airline  
4 pilots. I certified a lot of parachuting records,  
5 hot air balloon records, a lot of heavy iron  
6 records, space shuttle records, SR-71 records.

7 Q. I noticed that the NAA board has  
8 reciprocal memberships with other nonprofit  
9 groups; the list of the Academy of Model  
10 Aeronautics?

11 GENERAL COLE: That's correct. They  
12 actually, they are sort of the umbrella  
13 organization for the air sport organizations; the  
14 Academy of Model Aeronautics, the Balloon  
15 Federation of America, U.S. Parachute Association,  
16 Experimental Aircraft Association.

17 Q. Hang gliding?

18 GENERAL COLE: Hang gliding.

19 Q. Ultralights?

20 GENERAL COLE: Ultralights.

21 Q. So your work at the NAA did not  
22 involve, I take it, using, for instance, like the  
23 NUREG methodology?

24 GENERAL COLE: No, sir, it did not.

25 Q. Or the calculation of impacts from air

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1 crash?

2 GENERAL COLE: No. A lot of human  
3 factors and how not to impact the ground in a bad  
4 way.

5 Q. And I take it you had no involvement  
6 with fighter pilots in emergency ejections in that  
7 job?

8 GENERAL COLE: Not in that job, I did  
9 not.

10 Q. And then you left the NAA, I  
11 understand, and went to work for the National Air  
12 Traffic Controllers Association?

13 GENERAL COLE: That's correct.

14 Q. And you worked there for about four  
15 years?

16 GENERAL COLE: That's true.

17 Q. And that is the union representing air  
18 traffic controllers?

19 GENERAL COLE: That's true.

20 Q. And it's affiliated with the AFLCIO?

21 GENERAL COLE: That's correct.

22 Q. And your duties there would involve  
23 lobbying and other union activities relating to  
24 wages and so forth?

25 GENERAL COLE: Not really. That was

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1 the macro job of the organization, but they didn't  
2 have a safety director. They hired me as their  
3 executive director. I built a professional staff  
4 for them from 20 to 40, got good people in key  
5 positions, and I did a lot of the safety work  
6 until they hired a full-time safety director. I  
7 did go to the Hill and testify and I did work hard  
8 to improve controller working conditions and  
9 controller pay.

10 Q. And in this union type job, it didn't  
11 involve calculating aircraft crash probabilities  
12 in any way, did it?

13 GENERAL COLE: It didn't. It did  
14 involve, however, a lot of safety issues regarding  
15 the air route traffic control centers, the twenty  
16 in the use, TRACONS, the Terminal Radar Control  
17 Associations, and the towers, and the safety  
18 issues there.

19 Q. But it didn't involve anything to do  
20 with ejection of F-16 pilots, I take it?

21 GENERAL COLE: No.

22 Q. Did the Air Traffic Controllers Union  
23 pay you to work on this PFS application in any  
24 way?

25 GENERAL COLE: No.

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1 MR. SOPER: May I have this marked,  
2 your Honor.

3 (STATE'S EXHIBIT-146 WAS MARKED.)

4 Q. (By Mr. Soper) Sir, I have handed you  
5 what's been marked as State's Exhibit 146. Do you  
6 have that? It's not marked 146, but it's a  
7 document entitled Safety Analysis Report.

8 GENERAL COLE: Yes.

9 Q. And in the middle of the page it says  
10 Response, in bold letters. Below that, "Responses  
11 to this RAI were prepared based on information  
12 provided to PFS by J. L. Cole of the National Air  
13 Traffic Controllers Association."

14 GENERAL COLE: That's correct.

15 Q. "Washington, D.C." Did you prepare  
16 this document?

17 GENERAL COLE: It looks familiar. It  
18 would have been more administratively pure to say  
19 Burdeshaw Associates. I was working full-time at  
20 the National Air Traffic Controllers Association.

21 Q. It refers to a J. L. Cole. Is that  
22 you?

23 GENERAL COLE: That should be me.

24 That's correct.

25 Q. In this proceeding, you have gone as

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1 James L. Cole, Jr., I notice.

2 GENERAL COLE: That's my real name. I  
3 picked up "Jack" as a nickname. And I'm a Junior.

4 Q. But J. L. Cole, why did you choose that  
5 for this?

6 GENERAL COLE: Sometimes I use J. L.  
7 Cole not to confuse people between James and Jack.  
8 There's no purpose other than that. I often write  
9 things as J. L. Cole.

10 Q. I see. What did your employment with  
11 the Air Traffic Controllers Association have to do  
12 with this response?

13 GENERAL COLE: With the Air Traffic  
14 Controllers Association, probably very little.

15 Q. Well, it provides that you or at least  
16 gives the impression you were employed by them in  
17 connection with this response.

18 GENERAL COLE: Well, if it gives that  
19 impression, it's not correct. I was working as a  
20 Burdeshaw associate.

21 Q. I see. Thank you for clearing that up.  
22 You next worked for the Air -- excuse me, your  
23 Honor?

24 JUDGE FARRAR: It's not cleared up  
25 quite enough for me. Were you still -- this was a

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1 moonlighting assignment?

2 GENERAL COLE: This one?

3 JUDGE FARRAR: Yes.

4 GENERAL COLE: Yes, sir. I can  
5 elaborate a little. I was asked to join Burdeshaw  
6 Associates after I retired, and I did. But I  
7 said, "I'm working full-time. I can work when I'm  
8 available."

9 JUDGE FARRAR: So you were still the  
10 executive director of the Air Traffic Controllers  
11 Association?

12 GENERAL COLE: At that time, yes.

13 JUDGE FARRAR: And this was a --

14 GENERAL COLE: This was a Burdeshaw  
15 project, this one.

16 JUDGE FARRAR: In addition to your  
17 full-time job?

18 GENERAL COLE: That's correct.

19 MR. SILBERG: Just for clarification,  
20 if I might, looking at the document, it appears to  
21 be a document submitted by PFS to the NRC as part  
22 of the Safety Analysis Report. So my assumption  
23 would be that that document was prepared by PFS  
24 and, as it says, is based on information supplied  
25 by J. L. Cole. The actual text may or may not

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1 have come from the pen of General Cole and the  
2 introductory materials. That may have been  
3 supplied when it was prepared by PFS. I just  
4 don't know.

5 GENERAL COLE: I recognize the material  
6 but I don't recognize the document.

7 JUDGE FARRAR: Right. So in other  
8 words, the substance of paragraphs (a), (b), and  
9 (c) would have been something that you might have  
10 written in a letter to somebody.

11 GENERAL COLE: Yes, sir.

12 JUDGE FARRAR: And then they took it  
13 and dressed it up and so forth?

14 GENERAL COLE: Correct.

15 MR. SOPER: I would move the admission  
16 of Exhibit 146.

17 JUDGE FARRAR: Any objection?

18 MR. SILBERG: We just need to see if it  
19 is relevant to the issue.

20 MR. SOPER: Well, the relevance I would  
21 offer, your Honor, is I'm trying to trace through  
22 this witness's experience and background, and this  
23 is part of it.

24 MR. GAUKLER: Except I think there's a  
25 lot of information here that may not pertain to

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1 the particular issue that we now have. The  
2 subject was hanging bombs, which is a different  
3 issue. So to the extent that it goes -- I don't  
4 object to the document for the limited purpose  
5 that he proposes. But I do object to the attempt  
6 to use the substance of the document in the matter  
7 before them, raising the issues, argument issues.

8 JUDGE FARRAR: General Cole, did you  
9 have anything -- in other words you didn't write  
10 the (a) to (h), the lead-in stuff there?

11 GENERAL COLE: I don't recognize it.  
12 I'm digging back here a bit. But I recall  
13 gathering this information. I think I gave it to  
14 Shaw Pitman and it came out like this.

15 JUDGE FARRAR: But you would have done  
16 the (a) to (h) that are the responses?

17 GENERAL COLE: Yes, sir.

18 JUDGE FARRAR: That's, as far as you  
19 can tell, largely built on information you  
20 supplied?

21 GENERAL COLE: And I don't recall. I  
22 mean, if I'm working on a Burdeshaw project I list  
23 myself as a Burdeshaw associate. I don't recall  
24 writing that lead line there.

25 MR. GAUKLER: Your Honor, I believe

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1 this was an RAI response provided by PFS in  
2 response to a question from the NRC staff, and it  
3 is identified as such down on the bottom where it  
4 says PFSF Safety RAI No. 2, SAR 8-2. That's a  
5 numbering system that the NRC staff had for RAI  
6 responses. And I would add that the issue of this  
7 RAI was on hanging bombs, or hung bombs, and there  
8 was a particular issue at one point in time in  
9 Utah K on hung bombs on which the Board has  
10 granted summary disposition. And so in the sense  
11 of hung bombs, that is no longer an issue in this  
12 case. I would object to its introduction into  
13 evidence in that respect.

14 JUDGE FARRAR: Before I deal with that,  
15 Mr. Gaukler, I'm going to make sure I understand  
16 how this was prepared. You all -- Applicant needs  
17 some information in response to a Staff inquiry.  
18 You went to Burdeshaw or to General Cole. He  
19 provided the information. He was working for or  
20 was being paid by Burdeshaw for doing it; but the  
21 expertise, he was identified as what his full-time  
22 job was then. And then he supplied this  
23 information, much of which, on first glance, even  
24 though it was in response to a hanging bombs  
25 question which you say is -- in other words, that

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1 was when Judge Bollwerk was chairing the Board and  
2 you are saying that was a summary disposition?

3 MR. GAUKLER: That's right.

4 JUDGE FARRAR: But if the information  
5 in here, even though it was provided in response  
6 to a staff question about hanging bombs, if it  
7 bears on the question we are litigating here, Mr.  
8 Gaukler, why wouldn't that be relevant for that  
9 purpose? In other words, whatever the reason it  
10 was prepared, it seems, at least on my quick  
11 reading of it, to bear on the issues we are  
12 litigating here today.

13 MR. GAUKLER: Certainly some of it  
14 does, I would say, your Honor. I would say that.  
15 I don't know if everything does, but some does.

16 JUDGE FARRAR: Why don't we let it in  
17 to the extent that it bears on the issues today  
18 and you can trust us that we are not going to  
19 resurrect the hanging bombs issue.

20 MS. MARCO: Your Honor, we would ask  
21 that the date be put on the record.

22 JUDGE FARRAR: February 10, '99?

23 MS. MARCO: Yes.

24 JUDGE FARRAR: That being the date the  
25 Applicants submitted it to the Staff?

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1 MR. GAUKLER: The Applicant submitted a  
2 series of RAI responses in that time frame. I  
3 assume it was part of those RAI responses.  
4 February of 1999 we submitted a lot, Applicant  
5 submitted a lot of RAI responses to the NRC staff  
6 both on safety questions the Staff had raised, as  
7 well as environmental issues, questions the Staff  
8 had raised.

9 JUDGE FARRAR: Ms. Marco, if the  
10 precise date is important, can we count on you all  
11 to go back into your file? Somewhere in your  
12 files back at headquarters someone will know when  
13 this was received? Or if it's not, if the precise  
14 date is not important, then February of '99 would  
15 be good enough for everyone's purposes?

16 MR. TURK: Your Honor, may I address  
17 the point? It seems to me that this is something  
18 the State is offering. They haven't indicated the  
19 purpose they are offering it for. As Mr. Gaukler  
20 noted, it specifically relates to hanging bombs.  
21 You will have a lot of other evidence dealing with  
22 flight paths and other matters covered in this RAI  
23 response that is probably much more up-to-date.  
24 If this is February of 1999, then we are already  
25 three years later. And I don't understand that

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1 Mr. Soper wants to admit this for any purpose  
2 other than to show that General Cole's name was  
3 used in connection with the Air Traffic Controller  
4 group. I would not oppose it for that purpose,  
5 but otherwise I would oppose for anything stated  
6 in this document other than that.

7 JUDGE FARRAR: This is the objection  
8 you should have made five minutes ago when I asked  
9 for objections?

10 MR. TURK: I didn't understand you  
11 asked the Staff for our position, your Honor.  
12 Maybe we should interject more forcefully whenever  
13 we have an opinion. But I don't see the relevance  
14 of the document for anything other than to show  
15 the use of that name.

16 JUDGE FARRAR: Mr. Soper, that is a  
17 fair question from the Staff. What is the --

18 MR. SOPER: Yes, it is. In fact,  
19 before the last series of questions I had no idea  
20 exactly who prepared this, what organization they  
21 were working for, or for what reason. I find it  
22 remarkable that this is an official document  
23 offered by the Applicant, confirmed that this  
24 witness prepared it, and now everyone is acting  
25 like they don't want to acknowledge it.

1           The purpose of my inquiry, I assure  
2           you, was in good faith. I'm trying to find out  
3           what this witness's background, his extent of his  
4           work as a consulting person, subjects he has dealt  
5           with, and under the name and employer that he was  
6           working for when he did these items.

7           JUDGE FARRAR: I don't understand that  
8           anyone doesn't want to acknowledge it. But before  
9           they agree or don't object to its admission, they  
10          want to know why you're -- in other words, as I  
11          understand it, you could be offering it for two  
12          purposes; that there was something fishy going on  
13          with the - and I'm not saying it was - going on  
14          with the use of the organization at the time, or  
15          that, in fact, the substance of what is said here  
16          is something bearing on the case, or both. So if  
17          you will tell us what.

18          MR. SOPER: I'm sorry. I didn't mean  
19          to talk over you.

20          JUDGE FARRAR: If you will tell us for  
21          what purpose you are offering it, then your  
22          opposing counsel can narrow their objections. Mr.  
23          Gaukler?

24          MR. GAUKLER: I want to make a point,  
25          too, your Honor. This is just taken out of a

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1 document. There was a cover letter going with the  
2 official RAI. So if we wanted to really nail it  
3 down in terms of when this document was issued,  
4 under what cover, the State was provided with the  
5 complete RAI response, with the cover letter when  
6 they went in, and so they are just pulling a few  
7 pages out and kind of letting us guess is this  
8 really the actual document that went in or is it  
9 some draft they got in Discovery or some other  
10 place or what? So in terms of obligations,  
11 there's also an obligation there in terms of  
12 helping to make sure we have the setting correct.

13 JUDGE FARRAR: I think I understand  
14 everyone's position. It says on the bottom, Mr.  
15 Turk, help me, is this how -- this would not be a  
16 marking you all would have put on this, those  
17 notations on the lower left? That's how it would  
18 have come into you?

19 MR. TURK: We are taking a quick look  
20 at it, your Honor. It looks from the type of  
21 marking on the bottom it looks like it would be a  
22 PFS submission. Whether this was a final  
23 submission they made or something from Discovery,  
24 I can't say.

25 MR. SILBERG: One thing that is clear

1 is the writing on the top of the first page is not  
2 our writing.

3 MR. SOPER: I'd also note it doesn't  
4 have a Bates number. It was nothing that was  
5 produced to us.

6 MR. FARRAR: Mr. Silberg, you have to  
7 talk so the reporter can hear you. You said  
8 something about a Bates number?

9 MR. SILBERG: I'm sorry. Mr. Soper  
10 said there was no Bates number. I responded to  
11 say that there was no need for it because the  
12 State had the entire application. And if this was  
13 part of an RAI, they had already received it. So  
14 it wouldn't have been part of Discovery. They had  
15 it.

16 JUDGE FARRAR: I have the distinct  
17 feeling we are making much more of a problem of  
18 this than it is; and everybody, including the  
19 audience, is nodding their heads.

20 MR. SILBERG: I think if Mr. Soper says  
21 the purpose he wants it admitted for, we can move  
22 on.

23 JUDGE FARRAR: Yes. I think, Mr.  
24 Soper, I tried to ask that question before. And  
25 just like you insist on answers of the witnesses,

1 will you tell me why you are offering it?

2 MR. SOPER: Yes. I'm just offering for  
3 the range of the witness's experience. He  
4 testified that he furnished or prepared  
5 information for this, and I'm just interested in  
6 the scope of his experience in this matter.

7 JUDGE FARRAR: But you are not offering  
8 answers (a) through (h) for the truth of what is  
9 in them?

10 MR. SOPER: I am not.

11 MR. SILBERG: We don't have an  
12 objection.

13 MR. GAUKLER: No objection.

14 JUDGE FARRAR: And we have the  
15 General's explanation, which is even better than  
16 the explanation, of how this came to be.

17 GENERAL COLE: Yes, sir. It should  
18 have said J. L. Cole, Burdeshaw Associates. I  
19 didn't prepare that part.

20 JUDGE FARRAR: I think we have what we  
21 can out of this.

22 MR. SOPER: I would offer it on that  
23 basis, your Honor.

24 MR. GAUKLER: No objection on that  
25 basis.

1 MR. FARRAR: I'm nervous about  
2 cluttering up the record with exhibits that  
3 someone is going to look at later and think means  
4 something that they don't. Couldn't this just be  
5 left as marked for identification? Because we now  
6 have on the record the General's testimony about  
7 what he did and where he worked and how this was  
8 prepared. And to the extent that you need to rely  
9 on those answers later on in the case, I would  
10 rather you rely on those answers than that we  
11 admit this document that someone will later think  
12 really means something.

13 MR. SOPER: Our case does not hinge on  
14 this document, your Honor. And I think that  
15 that's a good solution.

16 JUDGE FARRAR: Then we will not --

17 MR. SOPER: Let me withdraw it. Will  
18 that help? Will that make it easier? Because I  
19 agree. This is a fine solution and I will just  
20 withdraw it. We have the answers we need.

21 JUDGE FARRAR: Before I let you do  
22 that, let's go off the record so I can ask my law  
23 clerk what you do with identifying unadmitted  
24 documents.

25 (Discussion off the record.)



1 JUDGE FARRAR: Mr. Soper, there seems  
2 to be agreement that we would rather you not  
3 withdraw it. We have spent time and someone needs  
4 to know what were we talking about. So it's in  
5 the record as identified, but not admitted.

6 MR. SOPER: Excellent, your Honor.

7 Q. (By Mr. Soper) If I may move on.  
8 General Cole, after the Air Traffic Controllers,  
9 you worked for the Air Transport Association of  
10 America? Is that right?

11 GENERAL COLE: That's correct. I'm the  
12 senior director for safety. And as that, I'm  
13 point lead on aviation safety issues for the major  
14 air carriers in our country.

15 Q. I understand that that is a trade  
16 organization for U.S. airlines; is that right?

17 GENERAL COLE: That's correct.

18 Q. And among other things, it advocates  
19 common industry positions before government  
20 agencies.

21 GENERAL COLE: That's true. Our member  
22 carriers fly 95 percent of the passengers and  
23 cargo in this country.

24 Q. Okay. And this organization does  
25 public relations for the airlines, among other

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1 things?

2 GENERAL COLE: That's true.

3 Q. This work didn't involve calculating  
4 the probability of aircraft crashes, did it?

5 GENERAL COLE: No, sir.

6 Q. And nothing to do with pilots ejecting  
7 in emergency situations?

8 GENERAL COLE: No, sir.

9 Q. Have you done any other work since  
10 retiring from the Air Force that I haven't  
11 mentioned?

12 GENERAL COLE: Other than Burdeshaw  
13 Associates, no, sir.

14 Q. Okay. This appears, then, on reviewing  
15 what you have just said, that this is your first  
16 occasion to use the NUREG 0800 methodology. That  
17 would be right?

18 GENERAL COLE: That would be right.

19 Q. And you have never before evaluated the  
20 probability that an -- I guess I have asked that.  
21 You haven't done a study on whether or not a pilot  
22 might avoid a particular ground site?

23 GENERAL COLE: Not a study, but I have  
24 been actively involved in that as chief of safety  
25 on human factors issues, crash avoidance.

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1 Q. Had you read NUREG 0800 before being  
2 hired by PFS?

3 GENERAL COLE: Yes. I recall reading  
4 it when I was chief of safety, because I was  
5 responsible for the safety and surety of Air Force  
6 nuclear weapons.

7 Q. Who was it at PFS that told you that it  
8 would be used for calculating the probability in  
9 this matter?

10 GENERAL COLE: I don't specifically  
11 recall anyone telling me that it would be used. I  
12 was familiar that it existed, and also the DOE  
13 standard 3014-96. And I did some casting about to  
14 see what tools would be available.

15 Q. I see. And again, you acknowledge the  
16 formula for calculating the aircraft probability  
17 that is found in that publication?

18 GENERAL COLE: True.

19 Q. But you didn't quite use that formula;  
20 but instead you used another formula that showed  
21 on page or is shown on page, excuse me, at  
22 Question 40 of your testimony, which is a slight  
23 modification of that. Page 40.

24 GENERAL COLE: Page 40?

25 Q. Question 40.

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1 MR. SOPER: Will it be helpful for me  
2 to hand out a page of that question?

3 JUDGE KLINE: I have it here. Page 15.

4 Q. (By Mr. Soper) At Question 40, do you  
5 have that before you, sir?

6 GENERAL COLE: I do.

7 Q. It says, "We calculated the probability  
8 that an F-16 transiting Skull Valley would crash  
9 and impact the PFSF using the following equation  
10 based on NUREG 0800." That formula, I'm going to  
11 read it.  $P \text{ equals } C \text{ times } N \text{ times } A \text{ over } W \text{ times}$   
12  $R$ . Is that correct?

13 GENERAL COLE: That's correct. That's  
14 what it says.

15 Q. Had you ever seen this derivation of  
16 the NUREG formula prior to your work with PFS?

17 GENERAL COLE: This one on Question 40?

18 Q. Yes.

19 GENERAL COLE: No. Not prior to my  
20 work with PFS.

21 Q. Who was it at PFS that suggested that  
22 you use this particular derivation?

23 GENERAL COLE: I can't recall anyone at  
24 PFS recommending this derivation. May I make an  
25 elaborative comment for you, though? By this time

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1 General Jefferson was on board doing the major  
2 calculation work. So I can't really give you an  
3 accurate answer on if anyone recommended this at  
4 all.

5 Q. So prior to General Jefferson coming on  
6 board, you hadn't dealt with this formula shown  
7 here?

8 GENERAL COLE: I don't recall dealing  
9 with this one. I do recall doing some work on the  
10 other one in the first scoping paper that I wrote,  
11 the 3 June paper.

12 MR. SILBERG: For clarification, when  
13 you say "the other one", could you explain what  
14 the other one you refer to it?

15 GENERAL COLE: This one.  $P$  equals  $N$   
16 times  $C$  times  $A$  over  $W$ , and this one is  $P$  equals  $C$   
17 times  $N$  times  $A$  over  $W$  times  $R$ .

18 Q. And have you done any of the  
19 calculations yourself using this formula or did  
20 General Jefferson --

21 GENERAL COLE: Which one? The one on  
22 Question 40?

23 Q. Question 40.

24 GENERAL COLE: General Jefferson did  
25 those calculations.

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1 Q. I see. Colonel Fly, let me ask you,  
2 did you do any calculations under the formula  
3 shown on answer to Question 40?

4 COLONEL FLY: The actual calculation  
5 was done by General Jefferson. We talked about  
6 the input and the numbers that were going in  
7 there.

8 Q. Did you have anything to do with  
9 deciding to use this formula or this methodology  
10 with an R value in it?

11 COLONEL FLY: I would say that came up  
12 in a series of discussions because as we started  
13 to talk about what happens when pilots do have  
14 emergencies. We talked about the fact that they  
15 do avoid facilities. So I had input into that  
16 piece of it in terms of at least the construct, if  
17 that makes sense.

18 Q. Who was present at the discussions that  
19 you talk about?

20 COLONEL FLY: That would be very  
21 difficult for me to tell you specifically because  
22 would did so much in collaboration with each  
23 other. Much was done over the phone. I'm not  
24 sure I could tell you specifically who was  
25 involved in each one of those conversations.

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1 Q. Do you have any better recollection  
2 than that, General Cole?

3 GENERAL COLE: No, sir. I believe that  
4 is accurate.

5 Q. General Jefferson.

6 GENERAL JEFFERSON: Yes, sir.

7 Q. I take it that you are the one that did  
8 the calculations, then, with this formula shown at  
9 Question 40? Is that correct, sir?

10 GENERAL JEFFERSON: That's correct.

11 Q. Let me ask you this, sir: Have you  
12 ever flown an F-16?

13 GENERAL JEFFERSON: No, I have not.

14 Q. Have you ever flown through the Skull  
15 Valley area where the PFS site is?

16 GENERAL JEFFERSON: No, I have not.

17 Q. Have you ever flown through the Utah  
18 testing training range?

19 GENERAL JEFFERSON: Yes, I have.

20 Q. In what type of aircraft?

21 GENERAL JEFFERSON: B-52.

22 Q. Have you ever piloted a fighter  
23 aircraft?

24 GENERAL JEFFERSON: I have piloted a  
25 fighter derivative called T-33.

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1 Q. T-33?

2 GENERAL JEFFERSON: Yes.

3 Q. That's a trainer, isn't it, sir?

4 GENERAL JEFFERSON: It's a fighter  
5 derivative. Comes from the F-80.

6 Q. My question, sir, is that a trainer?

7 GENERAL JEFFERSON: It is. It was. It  
8 is no longer there, but it has similarities to a  
9 fighter.

10 Q. And how many hours do you have in the  
11 T-33?

12 GENERAL JEFFERSON: It would be a  
13 guess. I flew it for about four and a half years  
14 after pilot training. I would say 400 or 500  
15 hours.

16 Q. And when is the last time you flew that  
17 aircraft?

18 GENERAL JEFFERSON: 1965.

19 (STATE'S EXHIBIT-147 AS MARKED.)

20 Q. General Jefferson, I handed you an  
21 exhibit that's marked as State's Exhibit 147. And  
22 I know your copy is not so marked.

23 GENERAL JEFFERSON: I just marked it.

24 Q. Okay. Thank you. It shows, sir, that  
25 the comparison of the formula appearing in NUREG

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1 0800 with the formula that you say you used in the  
2 answer to Question 40. Is that correct?

3 GENERAL JEFFERSON: That's correct.

4 Q. It appears to me, sir, that the only  
5 difference is you have added a multiplier to the  
6 end of the formula and designated it with the  
7 letter R. Is that correct?

8 GENERAL JEFFERSON: That is correct.

9 Q. The effect of this multiplier, of  
10 course, sir, is to reduce the calculated  
11 probability of a crash from that that you would  
12 get under the NUREG 0800 formula on the reasoning  
13 that even though the pilot knows his F-16 is about  
14 to crash, he won't eject until he has located the  
15 PFS site and made sure he is steering the aircraft  
16 away, at which time he will then eject. Is that  
17 the theory?

18 MR. GAUKLER: Objection. Lack of  
19 foundation.

20 MR. SOPER: This is cross-examination.  
21 I don't understand the objection.

22 JUDGE FARRAR: Mr. Gaukler, I think  
23 this has been part of the direct testimony so I  
24 would think there is a foundation here. Mr. Turk,  
25 you told me to remind you if you want to object.

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1 MR. TURK: I had turned to talk to one  
2 of our witnesses, your Honor. I didn't hear the  
3 question. I'm of absolutely no use.

4 JUDGE FARRAR: I'll catch you next  
5 time.

6 Objection overruled. Go ahead, Mr.  
7 Soper. Do you remember the question, general?

8 GENERAL JEFFERSON: I'd like to have it  
9 repeated, please.

10 JUDGE FARRAR: Let's have the reporter  
11 read it back.

12 (Pending question was read back.)

13 GENERAL JEFFERSON: The purpose of the  
14 R factor is to account for the fact that pilots  
15 can and do avoid ground sites when they are in  
16 emergency situations and about to crash. That's  
17 the purpose of the R. We brought it in in order  
18 to bring realism to this formula, that NUREG  
19 proposed is one way to do that.

20 Q. Excuse me, your last statement? NUREG  
21 what?

22 GENERAL JEFFERSON: The NUREG 0800 says  
23 the formula at the top of the page is one way to  
24 do this.

25 Q. I see. So based on that, you believe

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1 you could modify the formula and still be  
2 complying with NUREG methodology? Is that your  
3 understanding?

4 GENERAL JEFFERSON: Absolutely.

5 Q. And is this the first time you have  
6 ever had occasion to deal with NUREG 0800?

7 GENERAL JEFFERSON: In this project,  
8 yes.

9 Q. So you have never known another  
10 circumstance where this formula has been used?

11 GENERAL JEFFERSON: No.

12 Q. And in your opinion, the value for R is  
13 .145, or 14.5 percent; is that right?

14 GENERAL JEFFERSON: That's correct.

15 Q. And that would mean, I understand,  
16 then, that it would be your opinion that only 14.5  
17 percent of the expected crashes present a risk of  
18 impact?

19 JUDGE FARRAR: Impact on -- Mr. Soper,  
20 impact on the PFS site?

21 Q. On the PFS site. Excuse me.

22 GENERAL JEFFERSON: Yes. That's a  
23 reasoned opinion based on accident report review.

24 Q. I see. And that is because the other  
25 85.5 percent we can safely assume that the pilot

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1 won't eject until he has accounted for finding and  
2 steering away from the PFS site?

3 GENERAL JEFFERSON: Yes. Or any  
4 similar site, actually.

5 Q. So you think the PFS is just similar to  
6 any other ground site in that regard?

7 GENERAL JEFFERSON: No. What I'm  
8 saying is that it is not unique to the PFSF; that  
9 pilots do this if they see any sort of structure  
10 on the ground that they wouldn't want to hit, or  
11 live in their conscience that they hit that thing.

12 Q. And what would be the best study, in  
13 your view, of a pilot's ability to do that that's  
14 been published?

15 GENERAL JEFFERSON: Most of the  
16 information, other than the accident reports that  
17 we reviewed and made our study on, is anecdotal of  
18 pilots doing that sort of thing.

19 Q. So there is no study; just anecdotal  
20 references?

21 GENERAL JEFFERSON: As far as I know.

22 MR. SOPER: I would move to admit  
23 State's 147.

24 JUDGE FARRAR: Any objection?

25 MR. GAUKLER: No objection.

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1 JUDGE FARRAR: Ms. Marco? Let it be  
2 admitted.

3 (STATE'S EXHIBIT-148 WAS MARKED.)

4 Q. While Mr. Soper was distributing the  
5 latest document, he asked about a stopping point.  
6 He, of course, at that point was not part of our  
7 pre-hearing conference where I once had suggested  
8 we go later than 7:30. And I think some of the  
9 parties had said, "No, we have to get boxed up and  
10 moved over to the State capitol for tomorrow."  
11 There's nothing magic about 7:30. But, in fact,  
12 last night there was nothing magic about nine  
13 o'clock or 9:30 or whatever we got to.

14 Mr. Soper, why don't you keep going  
15 until you reach a change of subject, unless you  
16 all want to go -- we can change it to 8:00 or do  
17 you want to stick to close to 7:30?

18 MR. SILBERG: I guess I would give some  
19 deference to how long the witnesses want to go on.  
20 We have gone a while without a break. I suspect  
21 if we took a break we could keep going for a  
22 while. But I would give some nodding to the head  
23 of what the witnesses like to do.

24 JUDGE FARRAR: We have two choices. We  
25 can go another ten or twenty minutes and, Mr.

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1 Soper, when you reach a stopping point will quit  
2 for the day. Or if no one has so much work to do  
3 tonight, we could take a break now and keep going.  
4 All I care about is we finish by Saturday.

5 MR. SOPER: Why don't I finish this  
6 exhibit, and it will be brief, and then we end for  
7 the evening.

8 JUDGE FARRAR: Okay, fine.

9 MR. SOPER: Given the trouble we have  
10 had with an exhibit that's marked and pending,  
11 let's just wrap it up.

12 JUDGE FARRAR: There's two people who  
13 are more important than the lawyers and that's the  
14 court reporter and/or the witnesses. A witness  
15 needs a break. We will take a break. Let's come  
16 back in three, four minutes.

17 MR. SOPER: That's fine.

18 JUDGE FARRAR: And then we will go  
19 maybe a little longer.

20 (A break was taken.)

21 JUDGE FARRAR: We are back on the  
22 record after a short break. Mr. Soper will go as  
23 late as people want, but recognizing that each of  
24 you probably has more to do. Counsel has more to  
25 do tonight than we do. Why don't you find your

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1 next reasonable stopping point and we will quit  
2 there.

3 MR. SOPER: Thank you, your Honor. May  
4 I proceed, then?

5 JUDGE FARRAR: Yes.

6 Q. (By Mr. Soper) General Jefferson, I  
7 have handed you an exhibit that's been marked  
8 State's Exhibit 148. Do you have that, sir?

9 GENERAL JEFFERSON: Yes, I do.

10 Q. That exhibit, if I might offer, depicts  
11 the probability of a crash from F-16s flying  
12 through Skull Valley, which is the result that you  
13 calculated and is found on your cumulative  
14 probability table in the amount of  $3.11 \times 10^{-7}$ .  
15 And that was obtained using the formula we just  
16 talked about that's been modified to include an R  
17 factor, with the value of .145 used as that R  
18 factor. Does the first part of that appear as I  
19 described?

20 GENERAL JEFFERSON: That's correct.

21 Q. The following material on the page  
22 where it says without R factor is simply exactly  
23 that; it would be the calculation obtained using  
24 the same numbers that you used for all the other  
25 values in the formula except excluding the R, the

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1 value of .145. And that results in a value of  
2  $2.14 \times 10^{-6}$ . Is that correct?

3 GENERAL JEFFERSON: That's what it says  
4 here. I haven't done that math.

5 Q. I have provided that down below the  
6 calculation. Would that be the proper way to  
7 calculate it?

8 GENERAL JEFFERSON: I think that's  
9 correct. I don't know about the numbers. I can't  
10 vouch for them.

11 Q. Could I offer you a calculator to do  
12 those numbers?

13 GENERAL JEFFERSON: Sure.

14 That's correct.

15 Q. You are aware, sir, are you not, what  
16 the threshold probability for the design basis  
17 accidents would be for this particular facility?

18 GENERAL JEFFERSON: Yes, I am.

19 Q. And what is that?

20 GENERAL JEFFERSON: It's  $1 \times 10^{-6}$ .

21 Q. So then without this R factor, the  
22 probability of this activity alone would exceed  
23 the threshold limit set for this facility; isn't  
24 this right?

25 GENERAL JEFFERSON: If you did not use

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1 the R factor, which I think would be a mistake.

2 Q. But let's see if that's the answer to  
3 my question. I guess you agree with the  
4 calculations on this page, do you not?

5 GENERAL JEFFERSON: Yes, I do.

6 Q. So by not using the R factor, the  
7 result would exceed the threshold probability of  
8  $1 \times 10^{-6}$ ; is that right?

9 GENERAL JEFFERSON: If you did not use  
10 R, yes.

11 Q. Okay.

12 MR. SOPER: Your Honor, I would suggest  
13 this might be an appropriate spot to break for the  
14 evening, if that works for everyone else.

15 JUDGE FARRAR: Do you want to admit  
16 that exhibit?

17 MR. SOPER: Thank you very much. I  
18 move the admission of State's Exhibit 148.

19 JUDGE FARRAR: Any objection?

20 MR. GAUKLER: No objection.

21 MS. MARCO: No.

22 JUDGE FARRAR: Then we will admit it  
23 and, on that note, thank the witnesses for their  
24 testimony thus far. We will reconvene tomorrow  
25 morning at 10:30 in Room 129 of the State capitol.

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1 Jack, do you remember, can we leave  
2 documents there overnight?

3 MR. WHETSTINE: Yes. They are going to  
4 lock the room.

5 JUDGE FARRAR: So we are starting late  
6 tomorrow morning so that you can get set up over  
7 there. But then on future days we will be  
8 starting at 9:00 a.m. and all days wanting to go  
9 until 5:30 or thereabouts.

10 I think for anyone in the public, our  
11 people have handed -- there's a problem, as you  
12 may know, with parking at the State capitol,  
13 because there's reconstruction work going on. So  
14 don't get there at the last minute because you are  
15 going to have to fend for yourselves on parking.  
16 In the back we have handouts of where you can  
17 park. Jack?

18 MR. WHETSTINE: That's correct.

19 JUDGE FARRAR: So we will see you all  
20 there. And Ms. Chancellor, thank you for helping  
21 us arrange that space. This was a difficult week.  
22 We are sorry we have to move everybody around, but  
23 there was no space we could find for the entire  
24 week, given that we needed a large facility  
25 yesterday. All right, then. We are adjourned and

1 we will see you tomorrow morning.

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3 (Proceedings adjourned at 7:39 p.m.)

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CERTIFICATE

This is to certify that the attached proceedings  
before the United States Nuclear Regulatory Commission  
in the matter of:

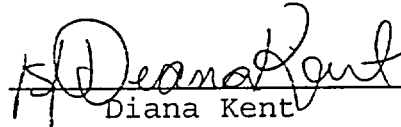
Name of Proceeding: Private Fuel Storage, LLC

Docket Number: Docket No. 72-22-ISFSI

ASLBP No. 97-732-02-ISFSI

Location: Salt Lake City, Utah

were held as herein appears, and that this is the  
original transcript thereof for the file of the United  
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